ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. XCIII, No. 24 Thursday, December 10, 1931

Revises 1932 News Print Contract Prices

International Paper Co. On Monday of This Week Announces Reduction in Price to $53 Per Ton in New York and Chicago and a Proportionate Reduction at Other Ports—This Is A Reduction of $4 Per Ton As Compared With Last Year—Two Canadian Mills Announce Similar Price Reductions

The International Paper Company notified its customers on Monday of this week it is reducing the price of news print to $53 a ton in New York and Chicago, effective January 1. This is a reduction of $4 a ton.

The company announced also that the price of news print for 1932 to its customers in Boston would be $52.50 a ton. The price at Norfolk, Va.; Jacksonville, Miss.; New Orleans, La.; and Houston, Texas, will be $53 a ton, and at San Antonio, Texas, $60 a ton.

The revised schedule of news print prices for 1932 does not provide for a blanket reduction of $4 a ton all over the United States. It does provide, however, a reduction in proportion to the prices established at ports.

The announcement by the International Paper Company followed its recent letter to its customers informing them a revision of news print prices was being considered. It also followed a recent announcement that Canadian producers would sell news print at $53 a ton delivered in New York, with proportionate prices for other zones in the United States.

Great Northern Announcement

The proposal of the Canadian mill owners was followed quickly by the announcement of the Great Northern Paper Company, largest exclusive news print producer in the United States, that its price for news print delivered in New York, effective Jan. 1, would be $55 a ton. Since then it has been declared that the Great Northern Paper Company would meet the prices established by its competitors. It was said Monday that before the end of this week customers of the Great Northern Paper Company would be informed the price of news print delivered in New York City for 1932 would be $54 a ton, with proportionate prices for the other zones.

Price Revisions in Canada

The Consolidated Paper Corporation and the St. Lawrence Corporation announced Monday that the price of news print for 1932 would be $53 a ton delivered in New York City, effective on January 1. The new price schedule reduces Canadian news print $4 a ton, to the same basis announced by the International Paper Company.

For the past several weeks representatives of the news print industry have been in conference here on the question of a new price schedule for 1932.

Sir Charles Gordon, president of the Bank of Montreal, in his address to the shareholders of the bank at the annual meeting today, commented on the position of the news print industry as follows:

"There is reason to believe that a better condition is being ushered in, by profit arising from the premium of New York funds, most of Canada's news print being exported to the United States, and from the consolidation of companies to reduce overhead expenses and effect more economical distribution of the product."

Mersey Mill Running Full Blast

Officials of Mersey Paper Company, of Liverpool, N. S., announce that with the mill having completed two full years of operations as at the end of last month, a total of 138,489 tons of news print has been produced and shipped from the plant. As the mill, with 2 machines operating, has a rated capacity of 250 tons daily, these figures would indicate, allowing some little time for the machines to attain their full efficiency, that capacity operations have been maintained almost without interruption throughout the two-year period.

Another interesting annoucement is that the company has built up a new market for its production in its recent invasion of the British West Indies. Shipments for this market, which go through New York have not yet reached notable proportions, but it is hoped that, through time, it will prove well worth the efforts made in its development.

That the company has not established this record of production and shipments at the expense of profits is indicated by the fact that, for the first full year of operations, the 1930 period, bond interest was earned with a sufficient margin, after generous depreciation, to have paid full dividends on the preferred stock of the company, this in a year when the old line companies were being forced to omit preferred dividends, and, in some cases bond interest, due to serious contraction in earnings. It is pointed out too that these results were achieved despite extraordinary selling expense involved in building up markets for the company's product among N. S. publishers.

Demand In Philadelphia Gradually Improves

Buying, However, Lacks the Briskness Usually Evidenced at This Season in Former Years—While Orders Are Expanding They Are Confined More to Requirements for Immediate Uses Rather Than to Future Needs—Paper Stock Markets at a Stand Still

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 7, 1931.—Though the paper industry appears to be gradually improving there is little of the snap to demands usually shown at this season and for holiday consumption. The wrapping paper division is more active than the fine and while orders are growing they still are confined to needs of the immediate future rather than for future stocking.

Where buying in bulk of book papers is concerned there is a fair amount of business being contracted over a period of from 6 to 8 weeks but the prices are low and payments are requested at an early date, whereas, the consumer prefers to postpone remittances until after the first of the year. Mills are not inclined to accept orders under these terms realizing that prices are attractively low and warrant early settlements.

There has been lessened activity in sulphites owing to the glut and prices are being cut to the bone on these with another 5 per cent cut on sulphite tissues. Grey bogus is another low priced commodity selling now at another ¼ cent reduction made last week. Though there was slight spurt in buying of converted products such as containers, and corrugated packing cases and like shipping containers they, too, have drifted to quieter channels despite the approaching holidays when consumption normally increases.

Distributors of fine papers find business spotty and of hand to mouth type with much price competition.

Parchment and wax papers are moving in spotty markets while bags are steadier but of low values.

The paper stock and rag markets are practically at a standstill with some inquiries coming in for new year supplies.

Penn Paper & Stock Co. Completes New Quarters

With the completion of the rebuilding of the structure recently damaged by fire at its paper headquarters 504-10 N. American street, the Penn Paper and Stock Company, is now equipped with a modern plant for the converting of paper products from the job lots and special purchases of paper in bulk which the firm features. There has been equipped a complete cutting, sheeting and rewinding department on the 22nd floor of the building with the most modern machinery installed. All the floors in the 4 story structure are of maple while the walls have been rebuilt of modern fire proof materials. The firm is now operating its converting department sheeting and cutting and winding news prints, krafts and other grades of papers in larger volume with the increased units and facilities for large scale production. The American street building is the paper house division of the Penn Paper and Stock Company, wholesalers of paper stocks, with warehouse and offices at 240 N. Front Street, of which William J. McGarity, Sr., is head.

Leshner Corp. Occupies Philadelphia Warehouse

A Philadelphia sales rooms and warehouse has been acquired by the Leshner Corporation, at 600 S. Delaware avenue, in the Bailey Building. The firm with main offices in Hamilton, Ohio, deals in wholesale paper stocks, textile waste including wool, cottons, and rayon, carrying full stocks in the large warehouse. A. Glantz, is head of the Philadelphia branch, as manager of the business. There is also stocked the full line of paper stocks sold to mills.

A. Hartung & Co. Adds Announcements

A complete announcement department has been added to the business of A. Hartung & Co., 506 Race street, with a varied and attractive assortment of social and business announcements stocked under the firm's own name. The large variety of cards, sheets and envelopes, is carried in all sizes, colors and weights. The firm which has been in the paper business for near half a century has added this line to its printing and box makers paper distribution. John H. Lees, is manager of the announcement department and brings to the department a broad following among printers, engravers and advertisers having been connected with the paper trade on these lines for several years.

Suit Against Reading Mills Settled

Henry Atwater's suit against the Reading Paper Mills for breach of contract of employment which was up for hearing in the Berks County Court at Reading, Pa., came to a sudden end, at the late November session, when on completion of Mr. Atwater's testimony, counsel for the Reading Mills made a request for settlement of the case. Following the testimony of the complainant Court adjourned for conference of attorneys for both sides and later Judge Schaefer, sitting at the trial, announced from the bench that the case was settled to the satisfaction of Mr. Atwater. The case was started last fall when suit was begun by the former sales manager against the Reading Mills when the latter broke its contract with the sales executive for employment covering a year's term from January 1st, 1930, to January 1, 1931, as sales manager of the up State paper manufacturing concern. Settlement involved salary and earnings over that period. The former sales manager was employed here in similar capacity in 1928 with the A. M. Collins Manufacturing Company, leaving this firm to go with the Reading Paper Mills. He resides in Cynwyd, near Philadelphia.

Penn Card & Paper Co. Stocks For New Year

Myer Magil, head of the Penn Card & Paper Company, Inc., 410 Race street, returned from a tour of the Eastern paper mills where he bought heavily of their output in bonds, bristol boards and card boards for the coming year's supply. The firm, which specializes in purchases of large lots of fine papers and card boards, will have on hand by January 1 between 15 and 20 car-loads of the papers purchased by the head of the company on his trip. Mr. Magil was two weeks on the tour of the mills in New England and the East. The firm with the purchase of its new larger paper warehouse and sales rooms at the Race street address installed a cutting and converting department.

Allen E. Whiting Host to Gov. Judd of Hawaii

Allen E. Whiting, president of the Whiting Patterson Paper Company, Inc., 320 N. 13th street, was host to Governor Lawrence M. Judd, of Hawaii over the Thanksgiving holidays and entertained the visiting executive at the foot ball games and other functions. Governor Judd is a former associate of the Whiting Patterson Company, having been affiliated with the New York headquarters of the paper house on its staff, leaving its employment to go to Hawaii and to rise to the chief executive of the Islands.

Government Dam At Kaukauna Is Improved

Improvement Costs $100,000 and Gives Modern and Convenient System of Control for Several Paper Mills Situated at That Point—Wisconsin To Have Two New Federal Forest Preserves—Kimberly-Clark Corp. Gets Close to $500,000 on Tax Rebate

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 7, 1931.—Power facilities at Kaukauna, Wis., where several large paper mills are located, have been improved greatly by the completion of a new government dam at that point. It replaces a wooden structure built there in the early days of settlement along the Fox River, and gives a modern and convenient system of control that will last a lifetime.

The dam is the largest on the river at Kaukauna, with a length of 600 feet. Concrete and steel were used throughout, and eight sluice gates have been provided. The spillways were lengthened somewhat to allow for greater flowage during periods of high water.

Construction Started in April

Construction was started last April and about 40 men have been employed. The old dam was removed by dredges of the government fleet. Concrete caissons were used for coffer dams. They were floated in place and then filled with water to weight them down. The low water condition during the summer, the lowest in many years, simplified the problem of construction considerably and no trouble was experienced with escaping water.

Although $130,000 was appropriated for the work, the actual cost was nearer $100,000. Everything is complete except for filling to be done along the canal walls.

New Forest Preserves for Wisconsin

Two new federal forest preserves are to be recommended for Wisconsin by E. W. Tinker, Lakes States forest director, in a program he has outlined for approval by the National Forest Reservation commission meeting in Washington soon. If adopted, Wisconsin's federal forestry acreage will aggregate 950,000 acres. The proposed new units include one in Oconto county of 177,000 acres and another in Taylor county of 115,000 acres. Mr. Tinker also suggests that the state be approached for consent to establish still another federal forest preserve of 200,000 acres in Ashland and Sawyer counties.

Wisconsin's total of federal forests is about 400,000 acres at the present time. The amount would have been larger, but consideration of further purchases was halted last spring. The forest commission will now be urged to take up the program from where it left off. Minnesota has about 2,100,000 acres of national forests and Michigan 1,350,000 acres. Wisconsin has been lagging, but is growing rapidly, Mr. Tinker says.

He adds: "The value of reforestation in this state to Wisconsin's $100,000,000 wood pulp and paper industry is obvious. We believe we have convinced the public and officials that the land proposed for forest areas is useless for agriculture and, in fact, for any purpose other than reforestation."

Kimberly-Clark Corp. Gets Tax Rebate

Kimberly-Clark Corporation, Neenah, Wis., emerged the victor to the extent of nearly half a million dollars in income taxes for the years 1916, 1918, 1919 and 1921 in action brought to recover that sum. The board of tax appeals has rendered a decision favorable to the company's claim that it has been overassessed for the years in dispute and that portions of the excess tax already collected are to be credited on income taxes due for other years and the remainder of the overassessment be reduced.

The deductions were granted on several grounds, among others that the deductions for depreciation of property were inadequate, and that the company lost through the abandonment of certain capital assets during the years in question. The total reduction granted for the four years was $495,533.92, all of which represents reductions in taxes of the Kimbery-Clark Corporation except $2,626.01 for its subsidiary, the William Bonifas Lumber Co.

Flambeau Paper Co. Loses Tax Case

Another tax case involving refunds of approximately $30,000 was lost by the Flambeau Paper Company, Park Falls, Wis. Suit was brought against the city of Park Falls by the company on its contention that its property was over-assessed. Litigation lasted for more than three years and 1,200 pages of testimony were taken. Hearings were held before Judge G. N. Risjord in the circuit court at Ashland, Wis., and he ruled that the valuation of $1,068,000 fixed by the board of review be sustained. Taxes for 1929 on which recovery was sought amounted to $10,754 and refunds of similar amounts were sought for 1930 and 1931. Guy Waldo, general manager of the Flambeau company, Herbert H. Fish, general manager of the Great Western Paper Company, Ladysmith, Wis., and Orbison & Orbison, engineers, and William A. Fannon, Appleton, Wis., testified for the company. No announcement has been made as to whether the case will be appealed.

Twenty months have now been completed by the Appleton division of the Consolidated Water Power and Paper Company, known as the Interlake Pulp and Paper Company, without a lost time accident. In February of next year, with the same good fortune, the total time will be two years. The consolidated's mill at Stevens Point, Wis., also is making a good record, with no lost time accidents for fourteen consecutive months. One accident at the Biron, Wis., mill after three months of perfect scores marred that record. The main mill at Wisconsin Rapids, Wis., with the largest number of men employed, now has two months to its credit.

At the Interlake mill, the wood room, usually considered the most susceptible place for accidents, holds the record, having operated 32,491 man days without a lost-time injury. The electric department is second with 23,539 man days and the boiler room third with 22,663.

Wisconsin Not to Get Thilmany Tax

The estate of the late Oscar Thilmany, founder of the Thilmany Pulp and Paper Company, Kaukauna, Wis., will not be subject to the large inheritance taxes demanded in the state of Wisconsin, according to a decision of Judge Fred V. Heinemann, of the probate court of Outagamie county, in which Kaukauna is located. His widow died a year ago while visiting in Germany, and it is reported that she left more than a million dollars. She had lived in New York for five years before going to Europe, and Judge Heinemann contends that established her residence in New York. The Wisconsin Tax commission wanted action brought to compel payment of Wisconsin taxes.

Anti-Dumping Law To Benefit Canadian Mills

The Advantages To the Paper Industry of the Dominion of the New Tariff Cannot, However, Be Completely Determined Until the Full Text of the Schedules are Available—Pulp and Paper Industry Bonused About One Million Dollars Per Month

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, December 7, 1931.—Effective on December 1 the first duties under Great Britain's new anti-dumping measure are at the rate of fifty per cent., based on value, and the probable effect on the Canadian news print industry is being canvassed. As goods from the British Dominions are not to be taxed, the Dominions being conceded full preference, certain Canadian manufactures are likely to be stimulated by this action. Among news print men the view is taken that the immediate benefit to that branch of the paper industry would depend upon whether a foreign tariff has been placed on ground wood and sulphite. This, however, is regarded as unlikely, and in that case, the benefit of the new schedules to Canadian news print will be small now, though it would seem likely that, in later years, Canadian producers may find the British market becoming gradually more receptive of their products. For, while Great Britain has recently produced the bulk of the news print she uses in her own mills, using ground wood and sulphite imported from the Scandinavian countries, she has also lately, to a limited extent, been importing a certain amount of full-manufactured news print. Her purchases of this, under the new tariff, should be made from Canadian mills to the exclusion of news print manufactured elsewhere.

It is possible that Canadian manufacturers of cover papers and Bristols may benefit to a certain extent from the new schedules, though such lines are manufactured in Great Britain, and the latter country, in fact, is a considerable exporter of them. But it certainly looks as though Canadian mills manufacturing kraft and other wrapping papers and those making boxboard, etc., should enjoy substantial advantages under the new tariff. It also looks likely that in the field of paper boxes, cartons, etc. Canadian plants will reap some benefit. Large amounts of greaseproof and glassine papers have been imported from continental countries, and it is felt that Canada should have a look-in on that business. Just what amount of benefit the new tariff will have upon the paper industry cannot be determined until the full text of the schedules are available.

Paper Industry Bonused on Sales

Attention is being called by authorities at Ottawa to the valuable assistance being rendered to the pulp and paper industry by the depreciation of the Canadian dollar in the United States. As a result of the ten to twelve per cent discount on Canadian funds, the pulp and paper industry is being bonused on its sales to the United States at the rate of over a million dollars a month. Eighty-two per cent of Canada's exports of wood, wood products and paper went, in the 1931 fiscal year, across the international boundary. The exports for October totalled about fifteen million dollars and on the basis of a ten per cent premium on United States funds, will net the Canadian exporter an additional $1,500,000.

Notes and Jottings of the Trade

According to a dispatch from Fort William, Ont., the Great Lakes Company there is not affected by re-organization of the Ontario and Minnesota Paper Company by E. W. Backus. The Fort William mill is operating under receivership of the National Trust Company, receivers for the Great Lakes Paper Company and is working a force of about 400 men on short time. No information is available as to the Fort Frances mill, which is affected by the re-organization, although the plant is said to be operating on full-time basis, with 325 tons of news print daily. Further east mills are operating at less than fifty per cent capacity.

The many friends in the Canadian paper box industry, of John R. Marshall, of the Nashua Paper Company, Peterboro, Ont., will sympathize with him in the death of his wife which took place in Peterboro a few days ago.

Col. Eric Reid, president of Reid Brothers, paper box manufacturers of London, Ont., left a few days ago to join Mrs. Reid in England preparatory to going on a trip around the world.

The British Columbia pulp and paper industry is prominently represented in a goodwill cargo which is being forwarded from Canada to Australia. The cargo, which will make an auspicious appearance in the Australian market includes 600 tons of news print, 300 tons of wood pulp, 2,000,000 fruit wrappers. It is also announced that prospective bookings for later sailings already cover 400 tons of wood pulp, fairly extensive news print orders and enormous quantities of fruit wrappers.

John B. Larkin, manager of branches for the Howard Smith Paper Mills, and well known in Toronto through his connection with the old paper house of Kilgours, has been elected a director of the Dominion Commercial Travelers' Association.

S. J. Frame, secretary of the Canadian Wrapping Paper Bureau, has returned to Toronto after attending a meeting of the section in Montreal.

The C. V. Syrett Paper Company, Ltd., wholesale paper merchants, Toronto, has issued an effective advertising piece, advising all to whom it may concern to wrap up and bury pessimism by the use of kraft paper.

It is understood on good authority that pulpwood activity in the northern part of Ontario has been resumed and that the Spruce Falls Power and Paper Company at Kapuskasing, has placed contracts with settlers in that district to cut 100,000 cords of pulpwood at an average price of $5.25 a cord. The company is also operating three camps of its own. It is stated that the Abitibi Power and Paper Company, in connection with its Smooth Rock Falls operations will take out a large supply of pulpwood. The Spanish River Lumber Company, Sudbury, also recently established two camps of 100 men each to take out logs for the coming winter.

Queen City Paper and Twine Company, Inc., has been granted a Dominion charter to carry on business of manufacturing and dealing in all kinds of paper, twine, board, pulp, wood pulp, etc. The headquarters of the company will be in Montreal and the authorized capital is $99,000.

Shareholders of the Don Valley Paper Mills, Ltd., met a few days ago at the head office on University Avenue, Toronto, and at a directors' meeting following, N. E. Wainwright was re-elected president and R. H. Joyce vice-president.

Demand In The Chicago Paper Market Lags

Orders Coming To Hand, However, Invariably Request Immediate Shipment Which Shows That Stocks Are Low and Indicates That An Improvement Is Apparently In Sight—Interest Grows In Suggestions for Some Method of Controlling Production

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, December 7, 1931.—Thanksgiving week has been characterized by quite a number of paper representatives in Chicago as one of the slowest business weeks experienced in many years. The past week has been only very slightly better and distributors and representatives are beginning to wonder just how long buyers can hold off from buying in view of their present scanty stocks. The orders coming in now are for the most part, unusually small but all are characterized by a request for immediate shipment—a strong indication of what paper firms can expect when that elusive "corner" is finally cornered.

Kraft Market Weak

The kraft market continues to be outstandingly weak here, according to reports. Prices have been cut below transportation costs and the buyers market evidently reigns supreme. News print advance contract quotations have given some indication of a lowering in contract prices when final contracts are made. The board market is slow and prices down, say reports. Glassines, wrappings and tissues have failed to find the holiday market very responsive. Books and covers remain about the same. Ground woods show little action. The number of inquiries reported continue to be the outstandingly favorable condition of an otherwise featureless condition.

Freight Rate Classifications Suspended

The action of the Interstate Commerce Commission in suspending the application of certain class freight rates prescribed in its decision in the eastern and western class rate cases until July 3, 1932, was hailed with mingled feelings of delight and disappointment by Chicago paper houses, manufacturers representatives, etc. The rates were to have gone in effect on December 3 and would have provided, in a majority of cases for increases over the existing rate level applying to paper as well as to other commodities. The suspension resulted from late protests pouring in from all over the country. Some grades of paper would have been affected by as much as five cents, say Chicago reports, while others would have been benefited by smaller but perhaps just as welcome figures. The consensus of opinion seems to be that the delay in putting the rates into effect will permit the paper trade as well as other industrial groups to present a more composite picture of what the effects will be. At any rate, there are paper men in Chicago who wish the proposal had gone into effect—and there are plenty more who are undeniably glad of the postponement.

Controlling Production

There is a rather definite and growing relief among Chicago paper circles that out of the present orgy of over production, flattened out demand and resultant depression of prices, there will probably have to come some method of controlling the production of all grades of paper. The demoralized market has gone to its most extreme depths because of the continual throwing of surpluses on the market. Grades of paper that are making the best selling records and price maintenance records in this market, say those interviewed. are kept that way because of closer associations and better mutual understandings between the manufacturers and convertors themselves. There are some who say that any control of production is virtually impossible. To these doubters others answer that such regulation must come if the paper industry is to prevent numerous market "breaks" such as are now characterizing the field. There is a belief that the industry must tabulate and study all of its productive branches; that it must make an extensive survey of the potential selling field and that mutual agreement must come into play to regulate the supplying of merchandise to this field. Such a program is being worked out in other industries from the standpoint of employment stabilization as well as from the profit viewpoint. If the current depression has the effect of binding the paper industry into closer contact it will be well worth the punishment taken, say many Chicago paper representatives.

Plans for Salesmen's Meetings

The Middle West division of the Salesmen Association of the Paper Industry will have no more special programs until at least after the first of the year according to announcements made this week. This does not mean that the regular Monday meetings at the Hamilton Club will not be held but it does mean that no speaking programs or entertainment of any kind will be featured. This is in line with a belief that present conditions warrant a close and continuous scrutiny of existing problems among the paper salesmen in their own respective fields and, as such, the regular weekly meetings will continue to be of genuine importance. The weekly reports on business conditions give the salesmen a birdseye picture of each industry while the round table discussions lead by Creighton Whiting, vice president of the district; Harold Knott, president of the association; Jim Coy of Flambeau; George K. Gibson of Mosinee and other veterans of the selling game will continue to prove mutually profitable and stimulating.

General News of the Trade

With Wm. Beier of Beier & Co. as its newly elected president the Chicago Paper Association is laying plans and formulating its program of work for 1932. A renewed policy of interchange of information, close cooperation and continuation of the study on costs, etc., will undoubtedly feature the activities of the Association in the next year.

For novel and timely interest the latest creation of the advertising department of the Eastern Manufacturing Company is well worthy of comment. The seasonal approach is there in the cover which features members of two opposing football teams starting action. The color is provided through cutouts of the players with the color of the sample letterheads on the third page showing through to the cover. "Letterheads at 'Business Form' prices" and "Business forms with 'Letterhead' Quality" provide the subjects for the interesting copy discussion while samples of office forms in varied colors complete the interesting—and seasonal—picture. The folder which surrounds the message is done on Atlantic Cover, granite, antique finish.

Fair Demand For Paper In The Boston Market

Individual Orders, However, Usually Are For Small Quantities Only—Distributors in the Main Are Cheerful As It Is Sensed That There Is A More Optimistic Feeling Among Large Paper Manufacturers, Some of Whom Are Buying New Machinery

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 7, 1931.—The wholesale paper market has averaged fair for the last week, although consumers have continued to place small orders only, as a rule. Distributors, in the main, are cheerful. It is sensed that there is a better feeling among the larger paper manufacturers, some of whom, at least, are buying new machinery. Wholesalers continue to offer new and desirable lines. Printers are placing orders in connection with direct mail campaigns of their customers. Bonds and ledgers are moving at their usual rate. The wrapping paper market has been a trifle better in December so far than during the previous month, so that dealers are much encouraged. Specialties in both paper and paper board are in fair demand.

Fair Demand for Paper Board

In the box board field, the demand is no better than fair. In some instances, at least, tonnage is reported as not so heavy. One reason ascribed for the decline is the fact that manufacturers of shoe boxes have not been placing orders in so large a volume as a few weeks previously. The situation in this respect, however, seems hopeful, as a slight increase in shoe production, which is country-wide, has developed in the last week or so. This slight increase is particularly noticeable in New Hampshire.

Little Change in Paper Stock

In paper stock, there has been little quotable change in prices during the week, although kraft No. 1 is a trifle lower, a condition reported to have developed from a greater supply on account of the holiday buying. This grade is quotable at .95 @ 1.05, against a previous range of 1.00 @ 1.10. The market remains generally dull.

Andrews Paper Co. in Fine Paper Field

The Andrews Paper Company, who have recently entered the fine paper field, have been appointed New England distributors of the products of the Howard Paper Company, Urbana, Ohio, and the Maxwell Paper Company, Franklin, Ohio. The latter concern has prepared a new folder, elaborating on the Maxwell Bonkote, a Maxwell achievement for 1931, which is being distributed to printers in New England by the Andrews Paper Company. The company have also been appointed New England distributors for the Gilbert Paper Company, Menasha, Wis., which manufactures an extensive line of rag content and all rag bonds, ledgers and writings, as well as the Gilbert safety check and Gilbert's thin papers. They will stock all these papers in ample supply in order to give real service to the printers. They will also carry other grades of fine papers for the manufacturers and the printing trade and the lines are to be announced shortly. Fred Herbolzheimer has charge of the fine paper department of the company. A well attended sales meeting was recently held when the policy of the house in regard to the fine paper division was announced.

News of the Trade

A sales meeting of the Storrs & Bement Company was held at the office of the concern Saturday at which company business was discussed by William N. Stetson, Jr., president, and John H. Brewer, general manager.

Col. Walter M. Pratt, of the Pratt Paper Company, is receiving messages of sympathy on the death of his wife.

W. E. Meroth, of the sales department of the Androscoggin Pulp Company, has left Boston for Los Angeles to take charge of the Pacific Coast office of the company. Mr. Meroth, who has been at the Boston office for some time, is motoring with his family to Los Angeles.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 9, 1931.—The Government Printing Office has received the following bids for 2,100 sheets of 20 x 25 blue gummed paper: Virginia Paper Company, Inc., $27.30; R. P. Andrews Paper Company, $27.93; The Whitaker Paper Company, $22.89; Lindemeyr Paper Company, $26.25; Barton, Duer & Koch Paper Company, $22.05; Mathers-Lamm Paper Company, $23.10; and Nashua Gummed & Coated Paper Company, $21.00.

The Government Printing Office has received the following bids for 6,250 pounds of rag gray laid cover paper; Knowlton Brothers, 13 cents per pound; Reese & Reese, Inc., 12 cents and 12.25 cents; American Writing Paper Company, Inc., 9.25 cents; R. P. Andrews Paper Company, 10.4 cents; and the Whitaker Paper Company, 9.5 cents.

The following bids were also received for 16,000 sheets of pencil carbon paper: S. S. Stafford, Inc., $8.00 per M sheets; Consolidated Ribbon & Carbon Company, $8.45; Old Town Ribbon & Carbon Company, $7.30 less 1 per cent; and the Kee Lox Manufacturing Company, $9.00.

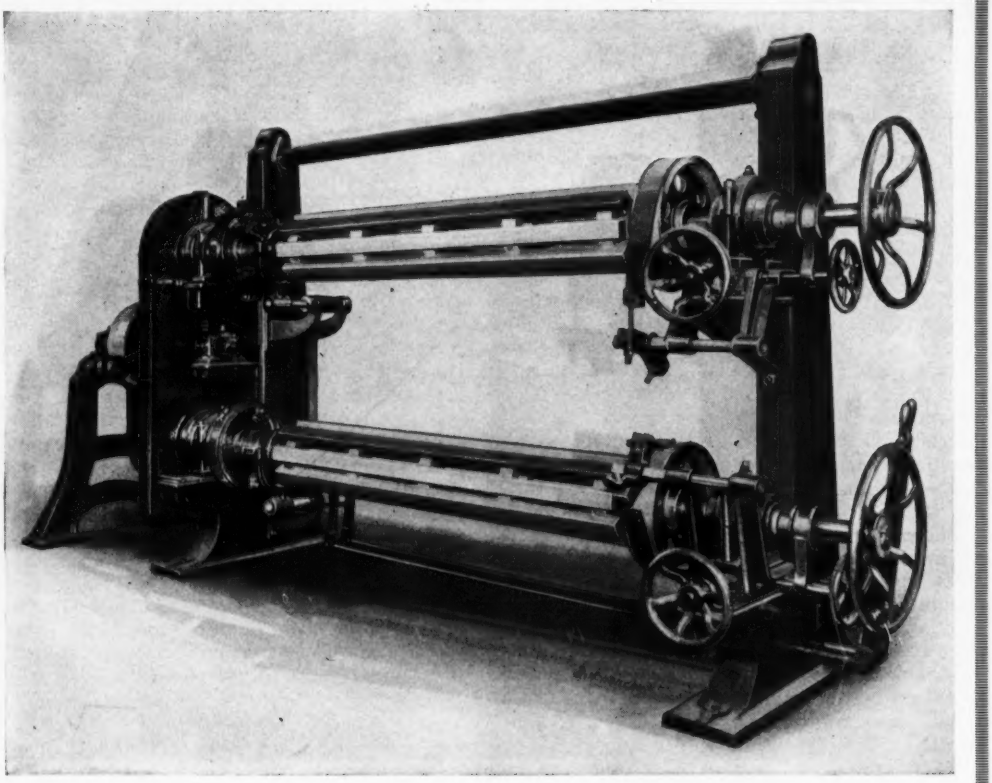
An Affiliated Service

Announcement has just been made by Johnson & Wierk, Inc. of New York, of a service affiliation with Skinner & Sherman, Inc., of Boston, Mass., which places both of these organizations in a position to render services of a broader character to the pulp and paper industries than was possible heretofore. The new arrangement does not mean the merging of these two organizations but will combine the engineering experiences of Johnson & Wierk, Inc., with the chemical and paper making experiences of Skinner & Sherman Inc. A client of either of these concerns now will have the advantage of the combined experiences of the two organizations in either mill construction, mill equipment, and the solving of manufacturing problems. The offices are conveniently located, one in the Grand Central Terminal Building, New York, and the other at 246 Stuart street, Boston, Mass.

Ask Reduction in Casein Duty

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 9, 1931.—The Centro de la Industria Lechera, Buenos Aires, Argentina, has filed an application with the United States Tariff Commission asking for a reduction in the casein duty.



LATEST TYPE 2-DRUM M & W UPRIGHT REEL

WITH ANTI-FRICTION BEARINGS

PERFECT ALIGNMENT

TO SUIT DRAW OF PAPER—

WITHOUT EXCESS FRICTION

ADVANTAGES

- **INDEPENDENT FRICTION CLUTCH DRIVE WITH LEVER FOR EACH DRUM**
- **OPERATION FROM FRONT SIDE**
- **IMPROVED BELT TENSION ADJUSTMENT**
- **LARGE BRAKE WHEELS WITH ASBESTOS LINING**
- **REEL DRUMS ADJUSTABLE LATERALLY AND LENGTHWISE.**

THE MOORE & WHITE COMPANY

Established 1885

PAPER MACHINE BUILDERS

15TH ST. & LEHIGH AVE. PHILADELPHIA, PA.

Effect of New Welding Code on Process Industries and Its Proper Application

By F. G. Sherbondy[1]

The advance that has taken place in the art of fusion welding in the last few years has probably never been paralleled by a similar development so materially effecting recognized and accepted practices of long standing.

The universal approval that has been accorded electrically welded construction, after what may seem a relatively short period of research and development is, I feel, chiefly due to three major conditions.

First:—There has been, for a long time, a genuine need for a method of constructing various types of retorts, vessels, etc. used by the process industries of a superior nature to the type commercially available and consequently the advantages of electrically welded construction were readily recognized and received by industries in general as a means of effectively and more economically carrying out many advanced processing requirements.

Second:—The thoroughness with which various fabricators of special steel and alloy plate construction attacked the problem of working out individual welding procedures which would control, within close limits, the many variables encountered, with the object of producing welded joints of a predetermined uniformity and definite strength.

Third:—The co-operation of various organizations such as insurance companies, societies and committees interested in the project and the painstaking and laborious task of unifying the many and various methods of welding employed by the individual manufacturers into a universal code to be accepted and approved by the various interests.

Rules for the construction of unfired pressure vessels as adopted by the A.S.M.E. Code Committee on July 7, 1931, place the stamp of approval of the highest engineering authorities on welded construction and effect a universal recognition of this method without commercial limitations.

It is to be expected that the 1931 code, permitting as it does, the construction without limitations, of any type of pressure vessel may present problems of classification and/or interpretation that is not always understood by the management or industries in general and likewise, it being the result of research and data supplied from so many different sources, may contain conditions, which when combined under a uniform procedure are likely to be misunderstood and misapplied.

Proper Interpretation of the Three Classes of Welding Permitted in the Code is Essential

To the industrial engineer preparing specifications for the construction of welded vessels, as well as to the management of industry in general, I should like to point to a feature that is of paramount importance, namely, that the classification of the accepted methods of welding in the 1931 code, under Classes 1, 2 and 3, is to be considered solely as—"A method of describing the recognized and accepted practices for welded construction" and not a means of qualifying or grading respective types or methods of welding as to their superiority one over the other. For example—Certain definite types of vessels, or, to be more exact, vessels of certain dimensions and for certain working conditions and pressures, are to be built under Class 1; certain other types of vessels are to be built in conformity with Class 2, and certain other types are to be built in conformity with Class 3 welding. These various classifications are the result of several years of painstaking research, countless tests and a collection of countless volumes of data covering the entire subject of welded vessel construction. From such efforts the classification referred to has developed, with the result that each class is distinctly within itself and is the recognized and accepted standard of construction for vessels of the type which fall into the respective classes.

There may exist a tendency, by some engineers who are responsible for the successful operation of various individual processing units, to place a capital burden on the management by not thoroughly analyzing the full meaning of the new code, and by arbitrarily specifying a type of construction, entirely unnecessary for the particular type of vessels under consideration, feeling that in doing so they have "played safe" and relieved themselves of any individual responsibility. This theory, fortunately is not often encountered, especially when dealing with engineers who are thoroughly conversant with welded construction and the details of code requirements.

There does exist, however, in the mind of an occasional engineer, the feeling that in order to be on the safe side, he must specify Class 1 construction, irrespective of conditions of service his individual unit is to operate under, whereas, as a matter of fact Class 2, or possibly Class 3 construction would in all probability give him a higher degree of safety than he has ever enjoyed before on similar plant apparatus.

It is needless to say that such a policy is economically wrong and such an engineer is not being fair with his management or to his profession.

The Much Discussed Subject of Stress Relieving

I doubt if any one subject that the code committee has had to consider was the subject of more discussion than this one particular phase of the specifications. Space will not permit details with reference to the various arguments pro and con on the subject. Perhaps it is sufficient to say that if a theory exists that stress relieving is a "cure-all" for all welding ills, the feature is very much over-rated and its benefits are very much misunderstood. Stress relieving, like many other requirements of the specifications, is to be recognized or perhaps to be more exact, the construction of vessels that are free from measurable or objectionable stresses, is a very important factor, comparable with ductility, uniformity and strength. However, the specifications applying to stress relieving for Class 1 vessels, as well as their application, to a limited extent, to Class 2 vessels, is the result of a compromise from the original thoughts on the subject, the compromise being largely effected by the favorable experience records of the products of certain welding procedures, wherein thermal stress relieving was not employed.

Thermal stress relieving, as required by the code, does not, nor was its function ever intended to, improve the tensile strength, ductility or soundness of the weld. Its application in the code is due largely to a broad interpretation of welding, on account of the fact that individual

[1] Member of American Welding Society, Vice President The Biggs Boiler Works Co., Akron, O.

ECONOMIES OBSCURED BY DOLLARS

HOW much does it cost you to run without equipment you think you cannot afford to buy? In many cases the cost is sufficient to equal the purchase price of the equipment in a few months' time. You have machines, men to run them and power to drive them, but economical production of paper or board is achieved only when all operating wastes are eliminated. If the installation of Downingtown Suction Rolls on your fourdriniers or Downingtown Extractor Rolls on your cylinder machines, would improve production or operation, can you afford to permit their moderate initial cost to delay the installation? Every day of operation without them would mean that part of their purchase price would be wasted, just as though you daily destroyed part of your output. Delay may be costing you money, therefore why not investigate these rolls immediately. On request we will gladly call on you or mail descriptive literature and actual performance facts showing the savings obtained by mills making various grades of stock. The Downingtown Manufacturing Company, Downingtown, Penna.

DOWNINGTOWN

ability or procedures cannot be recognized. Stress relieving on vessels of extremely heavy wall thickness however, is undoubtedly a good practice, if not an essential requirement.

It has, however, been the experience of our company and many others, on vessels constructed of plates up to 1½ inch in thickness, that thermal stress relieving is unnecessary and is regarded as an economic waste. This contention is shared by leading insurance companies who have had a background of several years' experience with vessels built under such welding procedures. On the other hand, it is possible that other welding procedures may look up stresses that must be thermally relieved, so that the rules adopted by the code committee are entirely justifiable. In no case, however, should thermal stress relieving be considered necessary in the production of welded vessels beyond the Code requirements, or if employed, such vessels should not be considered superior to vessels constructed under a procedure wherein the procedure itself is so controlled that measurable stresses are not originally set up.

It should be the object of every manufacturer of welded pressure vessels to protect his investment as well as the position that has been accorded welded construction, by constantly demanding the full and complete observance of the fundamentals of good welding. It should likewise be the duty of industries in purchasing welded equipment to inquire into the individual ability of the manufacturer, his experience and record of performance. The buyer should further earnestly consider the type of service in which the vessels under consideration are to be used and be guided by the proper interpretation of the A.S.M.E. code as to specifications.

Our company has been manufacturing welded high pressure vessels for several years for the various process industries and the continuous and satisfactory operation of such units prompts me to say that, notwithstanding the strides, that have already been made in welded construction, it is still in its infancy, but it is essential that the construction must not be unduly handicapped by improper application of fundamentals.

Electrically welded construction has definitely proven to be superior to other types of construction. While in some instances welded vessels may prove to be slightly lower in initial cost, due to the saving of material involved. I think this is entirely the wrong attitude to hold with respect to this class of construction. The saving to be effected due to decreased maintenance, general utility, prevention of loss in production due to repairs, certainly favors welded construction as to ultimate cost, irrespective of its initial or first cost.

Bagley & Sewall Report Improvement

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., December 7, 1931.—Officials of the Bagley & Sewall Company state that business in the small order department is showing improvement and that the future outlook is much better. An order for a small paper machine has just been obtained by the company and officials say that while it is merely an auxiliary to one of the large paper machines it is very encouraging at this time. It was announced that this latest order will mean an increase in the number of hours weekly for the present working force although it is not planned to take on any new help. It was pointed out that the filling of this contract will require only a fraction of the work necessary in turning out one of the larger machines. Patterns are now being made ready for the latest contract and actual construction work will start next week.

Newfoundland International Report

The International Power and Paper Company of Newfoundland, Limited, a division of the International Paper and Power Company, for the third quarter reports net revenue, available for interest and reserves, of $853,028, compared with $765,588 in the third quarter of last year, an increase of eleven and one-half per cent. Balance added to surplus in the third quarter was $248,540, against $194,986 in the corresponding quarter a year ago.

For the first nine months of this year, net revenue available for interest and reserves was $2,372,496, eleven and one-third per cent greater than for the first nine months of last year, and thirteen times the interest requirements for the period on the company's first mortgage 5 per cent bonds. After deducting depreciation and depletion, the balance was over ten times first mortgage bond interest. Balance added to surplus in the first nine months was $651,379 this year, compared with $377,644 last year.

Comparative statements are as follows:

	Quarter Ended September 30	
	1931	1930
Gross sales	$2,345,496	$2,034,991
Net revenue, inc. other income	853,028	765,588
Less:		
Depreciation and depletion	183,293	157,759
Int. on first mort. bonds	60,825	60,825
Int. on debentures, other int., and amort. of bond discount	360,370	352,018
Balance added to surplus	248,540	194,986
Surplus June 30	2,920,626	1,935,804
Surplus September 30	3,169,166	2,130,790

	Nine Months Ended September 30	
	1931	1930
Gross sales	$6,647,247	$6,265,800
Net revenue, inc. other income	2,372,496	2,130,068
Less:		
Depreciation and depletion	483,201	589,204
Int. on first mort. bonds	182,475	182,475
Int. on debentures, other int., and amort. of bond discount	1,055,441	980,745
Balance added to surplus	651,379	377,644
Surplus beginning	2,517,787	1,753,146
Surplus September 30	3,169,166	2,130,790

Tablet Firm Has Prosperous Year

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., December 7, 1931.—The Western Tablet and Stationery Corporation, of which the Kalamazoo Stationery Company is a division, enjoyed a successful year during 1931. Directors of the corporation have declared the regular preferred dividend of $1.75 a share, payable January 1 to stock of record December 21 and also declared a dividend of $1 per share on the common stock, payable December 21 to stock of record December 14. This makes a total dividend of $2 per share on the common stock, payable out of earnings during the fiscal year, ending October 31, 1931. This is the same dividend as paid on the common stock in the two prior years.

The president's report shows operating profit after depreciation to be $706,673.08. Depreciation included in operating expenses was $321,294. The corporation's current assets were $4,144,308.06, of which $2,250,405.07 was cash. Current liabilities were $431,219.44. The rate of current assets to liabilities was 9½ to 1 and the cash on hand is in excess of the current liabilities and the bonds outstanding, which are due October 1, 1941.

Swedish Position Satisfactory

WASHINGTON, D. C., December 9, 1931.—The Swedish paper industry was in a relatively satisfactory position at the end of the third quarter according to a report to the Department of Commerce. Prices were well maintained, and while sales generally were no larger news print mills were practically sold out for the current year, and some small orders were received for delivery in 1932 and 1933.

NATIONAL

USS

NATIONAL SEAMLESS

Backed BY THE MOST EXACTING STANDARDS IN MANUFACTURE · · ·

[U S S Chromium-Nickel Alloy Steels are produced under the licenses of the Chemical Foundation, Inc., New York; and Fried. Krupp A. G. of Germany.]

Behind every piece of Stainless and Heat Resisting tubular material that bears the NATIONAL mark, is a code of uniformity and of precision long adhered to, which has made NATIONAL-SEAMLESS Pipe and Tubes the standard material for a wide range of uses.

The same integrity and exactness which have always gone into NATIONAL products for uncompromising demands of many industrial uses are now applied to the series of U S S Chromium and Chromium-Nickel Alloy Pipe and Tubes.

Effective resistance to corrosion, unusual ductility, improved strength at high temperatures and protection from certain acids characterize these scientifically made steels. NATIONAL engineers, metallurgists, and laboratory technicians are at the service of any user of tubular products in the Paper Field to aid in determining the best application of Stainless and Heat Resisting Steel Pipe and Tubes to any particular requirement.

USS 18-8 CHROME-NICKEL—USS 17 CHROMIUM
U S S 12 CHROMIUM

STAINLESS AND HEAT RESISTING STEEL PIPE AND TUBES

USS STEEL

NATIONAL TUBE COMPANY
Frick Building, Pittsburgh, Pa.

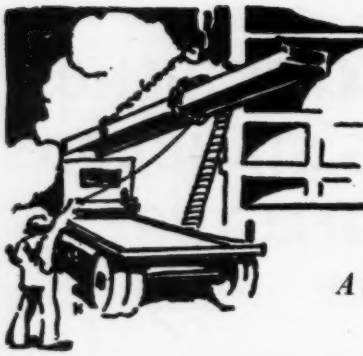
QUALITY PRODUCTS — Dependable Service

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES

American Bridge Company
American Sheet and Tin Plate Company
American Steel and Wire Company
Carnegie Steel Company
Columbia Steel Company
Cyclone Fence Company
Federal Shipbuilding and Dry Dock Company
Illinois Steel Company
Minnesota Steel Company
National Tube Company
Oil Well Supply Company
The Lorain Steel Company
Tennessee Coal, Iron & R. R. Company
Universal Atlas Cement Company

Pacific Coast Distributors—Columbia Steel Company, Russ Building, San Francisco, Calif.
Export Distributors—United States Steel Products Company, 30 Church Street, New York, N. Y.



CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Pawtucket, R. I.—The Metz Paper Company, Tweed and Harris streets, has approved plans for a new addition to its plant, consisting of a one-story unit, about 70 x 95 feet. General contract has been let to Henry M. Soule, 110 Brook street, and work will be placed under way at once. The building is reported to cost about $18,000, with equipment.

Brooklyn, N. Y.—The Muller Paper Goods Company, 2350 Linden street, Ridgewood, Brooklyn, has plans maturing and will award general contract in near future for proposed new addition to plant, to be used for general manufacturing and general operating service. It will be one and three-story, about 100 x 100 feet, located at Prospect avenue and Linden street, estimated to cost close to $80,000, with equipment. H. Bruckner, 2424 Myrtle avenue, Brooklyn, is architect in charge.

Cedar Rapids, Iowa—The Cedar Rapids Paper Box Company, 1113-19 Sixth street, S. E., is said to have preliminary plans under way for a new addition to plant for increased production, to be one-story, reported to cost about $17,000, with equipment. It is understood that bids will soon be asked on general contract.

Elkhart, Ind.—The Illinois Carton and Label Company, 2601 North Crawford avenue, Chicago, Ill., manufacturer of paper boxes, corrugated paper containers, etc., has taken bids on general contract for proposed new plant at Clark and Elkhart streets, Elkhart, to be one-story, 130 x 200 feet, reported to cost more than $60,000, with equipment. General contract is expected to be awarded during the next fortnight. A. B. Jennings is general manager.

Atlanta, Ga.—The Gaylord Container Company, Atlanta, has completed the construction of its new plant unit, previously referred to in these columns, and will operate at once for the manufacture of corrugated paper boxes and other containers. The plant has a rated capacity of 70,000 box units daily, and it is expected to develop this output at an early date. The company is affiliated with Robert Gaylord, Inc., 2817 South Eleventh street, St. Louis, Mo., which is now operating a group of seven paper box-manufacturing plants in different parts of the country, including a factory at Tampa, Fla., under the name of the Florida Container Corporation.

Brooklyn, N. Y.—The Belmont Paper Box Company, Inc., 480 Johnson avenue, Brooklyn, manufacturer of paper boxes and containers, has arranged for lease of space in the factory of the American Can Company, Third avenue and Third street, totaling about 30,000 square feet of space, to be occupied at once for a new plant. It is understood that the Belmont company will remove present works to new location and carry out an expansion program.

Kaukauna, Wis.—The Thilmany Pulp & Paper Company, Kaukauna, is continuing its awards for materials for completion of new plant units now under way, recently noted in these columns, and has placed a contract with the Jackson & Fahey Company, Milwaukee, Wis., for steel sash. Two new units will be built, 80 x 216 feet, and 43 x 280 feet, respectively, and turbine room remodeled.

Cleveland, Ohio—The Dobeckum Company, 3301 Monroe avenue, Cleveland, operating a paper converting plant for the production of transparent paper and other paper containers, is pushing construction on a new addition to its plant for increased capacity, consisting of a one-story unit, reported to cost close to $30,000, with equipment. The George S. Rider Company, Marshall Building, Cleveland, is architect and engineer.

New Westminster, B. C.—The Canada Rice Paper Mills, Ltd., 339 Railway avenue, Vancouver, B. C., has plans nearing completion for the construction of a new mill at the Lulu Island waterfront, New Westminster. The project will include a group of buildings, including main mill, boiler plant, warehouse and distributing unit, office building, and other structures. A contract for substructure has been awarded to the W. Jayne Pile Driving Company, Front street, New Westminster. It is proposed to place award for general construction at an early date. The entire project is reported to cost about $500,000, with equipment.

Laurel, Miss.—The Masonite Corporation, Laurel, is running on an active schedule at its local mill for the production of insulating board, insulating lath and kindred materials, giving employment to a working force of close to 200 persons. Present output is on a basis of about 40,000 square feet of finished board products per day, and is expected to be continued on the present schedule for an indefinite period.

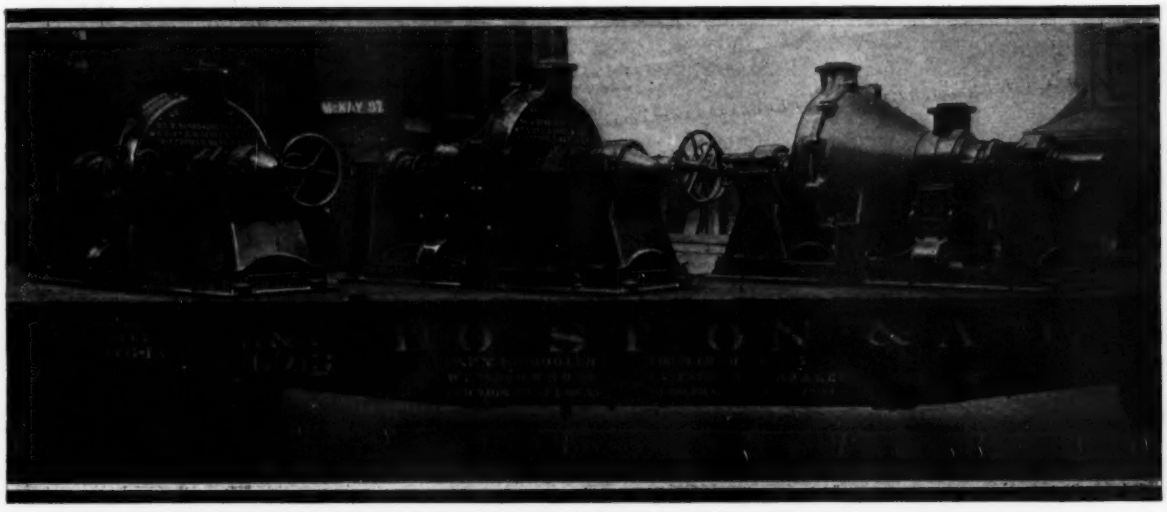
Brooklyn, N. Y.—The Interstate Corrugated Container Corporation, New York, has leased space in Building No. 9, of the New York Dock Company, totaling 30,000 square feet of floor space, and will use for local plant for storage and distributing service.

New Companies, Etc.

New York, N. Y.—The Gatite Products, Inc., has been incorporated with a capital of 1,000 shares of stock, no par value, to manufacture and deal in paper products, including fiber materials. The incorporators are John Mursch and Paul White. The company is represented by Frank M. McMahon, 100 East 42nd street, New York, attorney.

Chicago, Ill.—Beacon Paper & Specialty Company, 2037 Wabansia Avenue, has been incorporated with a capital of $10,000, to manufacture and deal in paper

ONE AFTER ANOTHER . . . . Leading Mills Specify • JONES EQUIPMENT ! . . .



A battery of JONES No. 2 Berkshire Refiners Ready for shipment to a large Southern Paper Co.

HERE is a carload of JONES Berkshire Refiners being delivered to a prominent Southern Paper Company. There are important reasons why JONES equipment was selected for this mill. First, seventy-five years' experience in making High-Grade Paper Mill Machinery is behind these machines. Second, they are accepted as the most efficient and dependable in operation. And there are other mechanical and service advantages that you will be interested to know about. Why not let a JONES engineer give you facts as to how this equipment can reduce costs in your mill. There is no obligation. Write us today.

PAPER-MAKING MACHINERY E.D. JONES AND SONS COMPANY ESTABLISHED 1846 PITTSFIELD, MASS.

Jones

E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of High-Grade Machinery for Paper Mills

goods of various kinds, paper boxes, etc. The principal incorporator is Edward T. Janis.

Long Island City, N. Y.—The Frost-White Paper Mills, Inc., have been chartered with a capital of $25,000, to manufacture paper products of different kinds. The incorporators are Morris Arzt, Samuel Wisnick and associates, Thomson avenue and Manley street, Long Island City. Company is represented by Harold H. Levin, 115 Broadway, New York.

Wilmington, Del.—The International Wallpaper Company has been incorporated under Delaware laws with capital of $100,000, to operate a mill for the manufacture of wall papers. The company is represented by the Corporation Trust Company, Industrial Trust Building, Wilmington.

Brooklyn, N. Y.—The George Zarrizzo Paper Stock Corporation has been incorporated with a capital of 200 shares of stock, no par value, to manufacture and deal in paper goods. George Zarrizzo is the principal incorporator. The company will be represented by Baer, Bennett & Fullen, 29 Broadway, New York, attorneys.

Philadelphia, Pa.—The Cabot Paper Stock Company has been incorporated with a capital of 100 shares of stock, no par value, to deal in paper and paper goods of various kinds. The company will be headed by Edward A. and Samuel Parris, 2628 Master street, Philadelphia.

New York, N. Y.—Isaac H. Lubin, Inc., has been incorporated with a capital of $20,000, to manufacture and deal in paper products. Isaac H. Lubin is the principal incorporator. Company will be represented by Gerald Jackson, 334 East Fiftieth street, New York, attorney.

Carton Co. To Build New Plant

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., December 7, 1931.—Workmen have just started construction of a $60,000 factory building for the Illinois Carton and Label Company, which will move its plant to Elkhart, Ind., from Chicago within the next three months if weather conditions are favorable for the plant construction. The company manufactures a line of clay-coated box board containers for many nationally known products and will employ about 125 persons.

The company last October purchased from the American Coating Mills the old Mengel plant and its four and one-half acres of ground. The old structure is to be reconditioned and used for storage purposes and the new building will house the manufacturing operations and the offices.

The new building will be on the north of the old Mengel building. The main factory building will be 162 by 132 feet and to the east in front will be an office structure 37 by 50 feet. Robert Taylor of Cincinnati and E. T. Gardner of Middletown, Ohio, president and vice-president of the company, were in Elkhart to see work started.

Beaverbox Co. Rebuilds

[FROM OUR REGULAR CORRESPONDENT]

BEAVER FALLS, N. Y., December 7, 1931.—Construction of the new plant for the Beaverbox Manufacturing Company is now under way and the frame work on the structure has been placed in position. The old plant was destroyed by fire several weeks ago and the task of rebuilding on the site was started immediately. Construction work has progressed to a stage sufficient to permit some manufacturing already and it is expected that full production will be in order within a few weeks. The company has been in operation only a comparatively short time and the growth of its business has been rapid.

New York Trade Jottings

Maurice Hoopes, president of Finch, Pruyn & Co., Inc., of Glens Falls, N. Y., was a New York visitor recently.

* * *

J. Arthur Woods has joined the sales staff of W. L. Jones, Inc., paper and twine, 96-98 Prince street. He will cover part of New York and out of town territory.

* * *

A painting done by Mrs. R. S. Kellogg, wife of R. S. Kellogg, secretary of the News Print Service Bureau, has been accepted by the National Academy of Designs, 215 West 57 street, for its Fall exhibition, which closes December 16.

* * *

Major O. M. Porter, secretary of the Kraft Institute, and Hugh Wright have sent out an interesting pamphlet entitled "The Kraft Situation. Its Causes and Remedy." This pamphlet deserves careful reading on the part of everyone interested in the kraft division of the paper industry.

* * *

Dr. Clarence J. West of the National Research Council, Washington, D. C., and chairman of the Bibliography and Abstracts Committee of the Technical Association of the Pulp and Paper Industry, was among the visitors in New York last week.

* * *

Alfred Bleyer & Co., paper converters, have sent out invitations to attend the opening of their new building at 47-05 Metropolitan Avenue, (Bohack Terminal), Brooklyn, N. Y., on Saturday afternoon, December 12, from two until five P.M.

* * *

Melvin R. Ware, consulting specialist for pulp and paper mill machinery, formerly located in Baltimore, Md., more recently at Plainfield, N. J., is now located at Glyndon, Md., where he will continue to carry on developments for automatic paper making systems.

* * *

Joseph H. Wallace, now of the engineering department of the Black-Clawson Co., Hamilton, Ohio, was among the trade visitors in New York during the week. Joe is traveling more or less extensively among the paper mills in his new position and states that he is getting a big kick out of his present work which is about the only side of the paper industry in which he has not already had a long and varied experience.

* * *

Fred J. Rooney, general chairman for the convention of the American Pulp and Paper Mill Superintendents Association to be held at Buffalo, N. Y., June 2-4, has appointed the following Publicity Committee: J. L. Hodgins, chairman, The Paper Mill and Wood Pulp News; F. Scott Dowd, Paper Industry; Tom Walden, Paper Products; Phil Howard, American Paper Merchant; Lloyd Thorp, Pacific Pulp & Paper Industry; J. N. Stephenson, Pulp & Paper Magazine of Canada, and Henry J. Berger, Paper Trade Journal.

Not To Dissolve Pulp Cartel

WASHINGTON, D. C., December 9, 1931.—Reports that the northern mechanical pulp cartel will be dissolved are denied in a report received from American Consul Osborne at Stockholm. The report states that the cartel is considering the revision of certain original regulations which have been unsuitable.

PROPELLAIR

TRADE MARK REG.

Airplane Propeller Exhaust and Ventilating Fans

The CURVED ENTRANCE HOUSING of Propellair Fans has proved its point. Standard Code Tests, conducted in the laboratories of various universities, show that Propellair Fans move more air per horse power and equal diameter propeller than any other airplane-propeller type fan. In addition to a propeller of accurate design, the CURVED ENTRANCE HOUSING, illustrated here and used on all Propellair Fans, properly guides the air currents, offers least resistance to their flow, and enables the full length of the blades to be efficient without restricting the area of the fan outlet.

Propellair Fans have non-overloading characteristics, the horse power curve being practically flat from free air condition to maximum static pressure at no air discharge. A safeguard against motor burn-outs—in other words you cannot overload the motor.

An unusual and comprehensive catalog, showing the full line of many styles and models of Propellair Fans, together with other valuable data, will be sent if requested on your letterhead . . . .

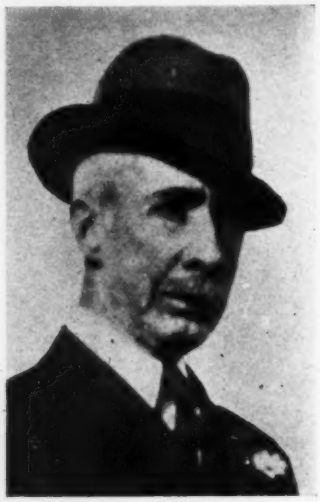
PROPELLAIR-INC

COLUMBUS, OHIO

Obituary

Edward Earle Howard, Jr.

ORONO, Me., December 7, 1931.—Edward Earle Howard, Jr., who for the past 40 years has taken an active part in the paper industry, passed away November 22 at his home in Orono, where for the past eight years he has been superintendent of the Orono Pulp and Paper Company, which merged with the Eastern Manufacturing Company in February, 1930. Mr. Howard was a descendant of a generation of papermakers of the Howard family and the son of one of the five Howard brothers of paper mill fame, having always been engaged in paper making.



EDWARD EARLE HOWARD, JR.

Born in Hartford, Conn., December 17, 1875, he went into the paper mill at the age of 14 at the Warren Manufacturing Company at Hughesville, N. J., after a few years being appointed night superintendent at the "Forge Mill" of the same company which position he held for seven years. He was then transferred to the Riegelsville, N. J., mill of the Warren Manufacturing Company as superintendent under George L. Bidwell and was later given charge of the Hughesville plant of this company. Company Mr. Howard took up the position of general After 29 years of service with the Warren Manufacturing superintendent of the Keystone Paper Company at Philadelphia. From Philadephia he came to Orono and tookcharge of the Orono Pulp and Paper Company which position he held until his death.

Mr. Howard is survived by his wife, Bertie S., and eight children.

W. P. Hawley

W. P. Hawley, 75, for many years a leader in the paper industry of Oregon and the west, and responsible for much progress and improvement in various lines of the industry, died at his home in Portland, December 1.

At the time of his retirement from business July 1, 1929, because of the incipient illness which resulted in his death, Mr. Hawley was president of the Hawley Pulp and Paper Company of Oregon City, the St. Helens Pulp and Paper Company, St. Helens, and its affiliated company, the California Bag and Paper Company.

He was born February 28, 1856, in Malone, N. Y., the son of a retired civil war veteran. When he was 16 he went to California with an emigrant train and at Stockton he took his first job in a paper mill, the start of his notable career. He managed mills in California and was always interested in new inventions and processes connected with paper manufacture.

In 1892 Mr. Hawley located in Oregon as superintendent of the Crown-Willamette mill in which he made a large investment. He resigned from this company in 1906 and organized the Hawley Pulp and Paper company of which he became president and which prospered from the start. In 1927 he organized and became president of the St. Helens Pulp and Paper company, at that time purchasing the California Bag and Paper company at Emeryville, which was then consolidated with the St. Helens concern.

Mr. Hawley's hobby as well as business was paper making, although he traveled widely and was an historian of distinction. He was a member of Grace Memorial Episcopal church at which his funeral services were held December 3.

Surviving relatives include the widow; one son, Willard P. Hawley, Jr. who was closely connected with his father in the paper business; Henry H. Hawley, Malone, N. Y., and four grandchildren. Eva Adele Hawley, Dorothy Velene Hawley, Philip Metschan Hawley and Williard P. Hawley III.

Chester Sipe

Chester Sipe, Superintendent of the Oswego Falls Corporation paper mills, died suddenly at his home, 211 South Third street, Fulton, N. Y., on Saturday evening, November 28, following a few hours' illness, a victim of heart disease.

Mr. Sipe was a native of Lancaster, Pa. During his entire life he was associated with the paper business and had charge of mills in Pennsylvania and was prominent in the development of kraft in the Southern States. He had been a resident of Fulton for about two years, coming here from the Cherry River Paper Company at Richwood, W. Va. During his time with the Oswego Falls Corporation he made some exceptional developments in board and paper specialties and made very marked improvements in the general methods and personnel of the organization.

Mr. Sipe was a 32d Degree Mason, member of Media Temple, Mystic Shrine of Watertown, Knights Templar of Richwood, W. Va. and of New Orleans lodge F. and A. M. He also was a member of Fulton lodge 830, Benevolent and Protective Order of Elks.

Surviving are his wife, Mrs. Ollie Rae Sipe, one daughter, Miss Jacqueline Sipe, both of Fulton, three brothers, Rev. D. F. Sipe, Martinsburg, W. Va., Horace Sipe and Harris Sipe of Manchester, Pa. and one sister, Miss Lilly Sipe of Altoona, Pa. Funeral services were held at ten A.M. Tuesday at the home with the Rev. Allan Hackett, pastor of the Presbyterian Church officiating. Burial was made in Streinstown, Pa.

Ask Higher Duty on Casein

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 9, 1931.—An application has been filed with the United States Tariff Commission asking for an increased duty on casein. It was filed by the Monite Waterproof Glue Company, of Minneapolis, Minn.

1932 EDITION

57th CONSECUTIVE ANNUAL EDITION

LOCKWOOD'S DIRECTORY of the PAPER & ALLIED TRADES

AUTHENTIC— —RELIABLE

THE OLDEST INDUSTRIAL DIRECTORY IN THE UNITED STATES

WHAT YOU DESIRE TO KNOW IN COMPLETE FORM

RELATIVE TO EVERY PULP AND PAPER MILL ON THE NORTH AMERICAN CONTINENT IS TO BE FOUND IN THE

NEW 1932 EDITION

A new feature listing all types of machinery and accessory equipment, raw materials, etc., used in pulp and paper mills, converting plants, including the name, street and city address of each manufacturer, makes it the most complete reference medium in its field.

ORDER YOUR COPY NOW

AND HAVE THE LATEST COMPLETE INFORMATION AT HAND JUST WHEN YOU WANT IT. PREVIOUS EDITIONS ARE OBSOLETE. PRICE $7.50 DELIVERED

OVER 1000 PAGES OF INVALUABLE INFORMATION

Special Traveler's Pocket Edition

bound in a flexible cover, comprising the Paper and Pulp Mills, Coating Mills and the Mill Officials. Price $7.50, including delivery charges. ($7.00 cash with order.)

Published by

LOCKWOOD TRADE JOURNAL CO.

10 E. 39th St. ~ ~ NEW YORK, N. Y., — — U.S.A.

PAPER TRADE JOURNAL

ESTABLISHED 1872

Published at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial Offices, 10 East 39th St., New York, N. Y.

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Reginald Trautschold, M. E.,
Power Engineering Consultant

Lynne M. Lamm, *Washington Correspondent*

Price. Per Copy, 10 Cents — United States, Per Annum, $4.00
Canada and Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. XCIII New York, December 10, 1931 No. 24

NEW FORESTRY BOARD PROPOSED

That the time has come to organize a board of forest strategy in New York State was the statement made by Dr. Hugh P. Baker, Dean of the New York State College of Forestry at Syracuse University and formerly executive secretary of the American Paper and Pulp Association, at the annual meeting of the Conservation Association in Syracuse, November 21. In an interview Dean Baker further outlined his idea of this proposed body representing all of the forestry agencies in the State.

"The approval of the Hewitt Reforestation Amendment," said Dean Baker, "has committed this State to the practice of forestry and that involves important problems some of which we are not yet quite sure as to how they should be handled. We need more forest research. We must know more about soils, climatic conditions and tree species. The wide scope of these problems and the policies involved require team-work if they are going to be solved in the most direct and economical way. The forestry agencies of the State have been doing work through the years independently, but the time has come when old methods will no longer meet the challenge to the foresters and the forestry interests in New York. This new responsibility must be met by united endeavor."

Dean Baker said that he saw no reason why the agencies interested in forestry in the State could not form a co-operating body which might be called a board of forest strategy which would focus the best thought, both professional and lay opinion, on the big forestry problems. "Such a board," continued the Dean, "would avoid the waste of time and effort and duplication of work which occurs in inco-ordinated individual activities.

"In these days of rapidly moving events, involving state-wide projects and vast sums of money, organization, co-operation and co-ordination are necessary in order to obtain efficient handling of such public and professinal problems. It is simply a question of better business methods being applied to these public-professional activities in forestry."

UNFAIR FOREIGN COMPETITION

The desperate efforts of foreign paper mills to sell their papers in this country are not meeting with great success because of the aggressive efforts of the Import Committee of the American Paper Industry in combatting unfair foreign competition. A report to subscribing mills just made by Warren B. Bullock, manager of the Import Committee lists among others the following cases decided in the United States Customs Court, overruling claims made by importers:

Eight cases involving matrix board in which the importers failed to overturn the finding of the customs officials that the merchandise had been undervalued remission of additional duties in lieu of penalty for undervaluation denied to importer of fancy paper, on ground that he could not prove he did not intend to defraud the government; undervaluation found in Los Angeles importation of papeterie; importations of imitation parchment paper at New York and Norfolk held dutiable as such at 3 cents per pound and 15 per cent, and not as wrapping paper as claimed at 30 per cent; butchers sulphite imported at Boston classified for duty as imitation parchment at 3 cents per pound and 15 per cent, not as wrapping paper at 30 per cent as claimed.

Cases in which action was taken by administrative officials in the Customs Bureau, in which the position of the Import Committee is upheld include the following:

New York importer of papeterie required to advance the dutiable value 30 per cent, this involving all his importations, from Germany; silver embossed paper imported at Philadelphia classified for duty at 5 cents per pound and 15 per cent, not at 4½ cents per pound and 20 per cent as claimed by importer; importer of sensitized paper for use in slot machines allowed to revise his statement of dutiable value by making it five times the original invoice value; St Louis importation of embossed metal leaf paper classified for duty as coated paper at 5 cents per pound and 15 per cent, not at 4½ cents per pound and 20 per cent as claimed by the importer; corrugated board classified at 35 per cent as manufacture of paper, not at 30 per cent as laminated board as claimed by the importer, this being an effort by importers to invade the field of domestic manufacturers of corrugated board for shipping cases; metal coated light weight paper classified for duty at 5 cents per pound and 18 per cent, not as decorated greaseproof paper as claimed by importer at 3 cents per pound and 15 per cent; importer of kraft wrapping at Norfolk accepts finding of undervaluation without protest.

Some of the new cases not yet decided are: Many im-

portations of kraft wrapping paper from Sweden believed to be undervalued; twelve importations of Swedish kraft paper for three Massachusetts envelope manufacturers held by customs officials to be undervalued; catalog paper imported at San Francisco claimed to be duty free as standard news print, will be held for duty if paper of this type is held to be not chiefly used by newspapers.

Names New Backus Receivers

In a reorganization last week of the receivership of the Minnesota & Ontario Paper Company, subsidiary of the Backus-Brooks Company of Minneapolis, C. T. Jaffray, president of the Soo Line railways, and Richard H. M. Robinson of New York were appointed as new receivers of the company.

They succeed E. W. Backus, E. W. Decker and Charles R. Fowler, who were appointed as receivers last February, when the company went into voluntary receivership. The new receivers were named by Judge J. W. Molyneaux of the United States district court, who approved a petition signed by the outgoing receivers and assented to by creditors of the Minnesota & Ontario Paper Company.

The retiring receivers are turning over to Mr. Jaffray and Mr. Robinson some $2,000,000 in cash, secured from operating revenues and sale of paper stocks and other assets in current inventories.

All plants and assets of the Minnesota & Ontario Paper Company and its 17 wholly-owned subsidiaries are taken over by the new receiverships. The plants include the big paper mills at International Falls, Minn., and Fort Frances, Ont.

Among the subsidiaries are the National Pole & Treating Company, and the Insulite Company, manufacturer of insulating board. The latter, which also has a mill at International Falls, has just completed an insulite plant in Finland, which will supply established markets for the products in Great Britain and on the European continent. The National Pole & Treating Company last week refinanced a maturing note issue of $2,000,000, putting the concern on a sound financial basis, the retiring receivers said in their petition to the court.

Other subsidiaries of the Minnesota & Ontario are the Kenora Paper Mills Company, at Kenora, Ont.; Fort Frances Pulp & Paper Company, at Fort Frances, Ont.; Keewatin Lumber Company, International Lumber Company and four hydro-electric companies, operating water-power dams and plants with a developed capacity of 92,000 horsepower.

In a statement on behalf of both the new and old receiverships, it was explained that the change is the result of carefully worked out plans, following several months of work in auditing the company's books and surveying its plants and other properties. Operation of the properties has been conducted through the original receivership on a sound basis, according to the statement.

Swedish Wage Agreement Cancelled

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 9, 1931.—The Swedish Pulp Mill Owners Association has cancelled, effective February 1, the collective wage agreement with the Swedish Paper Mill Workers' Union, with a membership of approximately 14,300 laborers according to a report from Acting Commercial Attache McLean at Stockholm. The employers organization is reported to be demanding a wage cut.

TAPPI Annual Meeting

Part of the tentative annual meeting program of the Heat and Power Committee of the Technical Association of the Pulp and Paper Industry to be held February 15-18, 1932 has been announced by M. H. Teaze of Hardy Ferguson & Company, chairman.

The committee as now organized consists of four subcommittees specializing in several types of work indicated by the title of the subcommittee.

1. Production and Transmission of Heat and Power.
2. Heat Utilization in Chemical Processes.
3. Heat Utilization in Pulp Drying and in Making Paper and Paper Board.
4. Power Requirements.

The principal investigation inaugurated this year has been that of establishing a general form or guide for the collection of data relative to power plant operation efficiencies and the costs of steam and electric power as a by-product of process steam or from condensing operation.

One of the functions of the committee is to serve as an aid to the industry in answering questions regarding specific problems. Any engineers in the industry are welcome to send such questions to the Technical Association office at 370 Lexington avenue, New York City. An interchange of experience along the lines of the discussion of practical and theoretical operating problems is very beneficial, particularly to those participating.

The committee on power requirements has inaugurated a project to secure data on actual power requirements for auxiliary apparatus, such as beaters, jordans, calenders, agitators, etc. This symposium will be presented at the annual meeting and will serve an extremely useful purpose.

The papers which have been definitely promised for the annual meeting are as follows: "Causes, Effects and Remedies for Low Power Factor," by H. W. Rogers; "Insulation Materials and Methods for Electrical Apparatus," by E. C. Dieffenbach; "Pumping Pulp at High Consistencies," by M. M. Klosson. There will probably be a paper on "Dust Recovery," by J. C. Dardigg. A feature of the meeting will be a paper by Dr. Walter N. Polakov, consulting engineer and former advisor to the Russian Soviet Government, who will read a paper on "Integrated Power Economics."

Taggart Paper & Bag Co. Resumes

HERRINGS, N. Y., December 7, 1931.—Operations are to be resumed this week at the plant of the Taggart Paper and Bag Company on a schedule of three days a week. The receipt of a number of orders for wrapping paper used in production of paper bags is said to have been responsible for the decision to reopen the mill and it is probable that operations will be continued without any interruption.

Mills of the company here and in Carthage have been shut down for the past three weeks because of a slowing up in demand for their products and announcement of a resumption of activities was welcomed by local business men. Both plants are equipped to produce the same sizes and weights of paper but the local branch is said to be operated on a more economical basis. It is expected that activities will be resumed at the Carthage plant in the near future in view of the increasing volume of orders. A few of the machines that turn out small paper bags have been kept in operation steadily during the past few weeks despite the closing of the other departments at the local mill.

(No. 5 of a series of advertisements tracing the development and uses of modern chemicals.)

HIGH SPOTS IN CHEMICAL HISTORY

SODA ASH

WHILE Paris thrilled at Napoleon's victories in Austria, Nicolas Leblanc ended a life of frustrated hopes by committing suicide. In the early days of the French Revolution he had seen his soda works confiscated by an angry mob... his dream of a lifetime shattered. In building the first commercial plant for manufacturing soda ash (1791), Leblanc gave his country... and the world... a process which was a forerunner of present-day methods of manufacturing one of man's most useful commodities... soda ash.

The beginning of the modern ammonia-soda process, now the universal method of producing soda ash and the only method ever used in the American alkali industry, dates from 1838. No successful manufacture by this process is recorded, however, until after 1860, and it was not until 1895 that the production of soda ash by the ammonia-soda process exceeded that by the old Leblanc process.

In the United States, the glass industry takes annually about 590,000 tons of soda ash. Then, there's the chemical industry using 290,000 tons ... the soap industry taking 200,000 tons... to say nothing of the textile, rayon, pulp and paper, petroleum, steel, iron and food industries... as well as the manufacturers of dyestuffs, leather and photographic materials. In fact, so widespread is the use of this important basic chemical that soda ash consumption is considered one of the reliable barometers of industrial activity.

• • •

Mathieson soda ash has long been accepted by chemical consuming industries as the standard of high, uniform quality. Up-to-date shipping facilities and nearby warehouse stocks enable Mathieson to serve manufacturers in all of the most important industrial centers.

A mob of French revolutionists at St. Denis, France, ransacked the first plant erected for manufacturing soda ash by the Leblanc process.

Great Structures Rest on Strong Foundations

MATHIESON CHEMICALS

SERVICE

RESOURCES | RESEARCH

Soda Ash... Caustic Soda... Bicarbonate of Soda... HTH (Hypochlorite)... Liquid Chlorine... Bleaching Powder... Ammonia, Anhydrous and Aqua... PURITE (Fused Soda Ash)... Solid Carbon Dioxide

The MATHIESON ALKALI WORKS (*Inc.*) 250 Park Ave., New York, N. Y.

Philadelphia Chicago Providence Charlotte Cincinnati

Works: Niagara Falls, N. Y.; Saltville, Va.

Warehouse stocks at all Distributing Centers

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Positive Drives in the Paper Mill

By W. H. Kinkaid[1]

The evolution of driving refining engines in paper mills starts with the old water wheel as a source of power. From the slow water wheel it was a very simple matter to drive to the engines which were also designed to operate at comparatively low speed through belts, gears, and the other transmissions common to the old paper mills.

However, with the advent of electric power it presented a very different problem. As the cost and inefficiency of electric motors increase in proportion to the decrease in speed it was quite natural that the paper manufacturers gradually increased the speeds of their refining engines. Starting with the old water wheel speed the refiners have been stepped up until some are now operating 600 r.p.m. or more.

About a year ago the general superintendent of a prominent paper manufacturer came to the conclusion that the refining of paper pulp offered an excellent example of the application of the so-called rule-of-thumb as applied to refining engine speeds.

The first experiment was to determine the most efficient speed that a refiner should run on a certain grade of paper. This was accomplished with the use of a Link-Belt silent chain drive using different sized pinions to get the desired speed. It was then found that it was detrimental to the life of the plug and the grade of paper to have an overhung load on the refining engine shaft, it produced closer clearance on one side of the plug than the other. In order to eliminate this condition it was found necessary to use a coupling between the prime mover and the refiner, the coupling being of the standard refiner type with 6 to 9 inch lateral adjustment. Using this equipment we found that the results obtained would unquestionably justify the changing over of the refiners.

The use of a silent chain drive with self supporting base did not lend itself to the available space so a Link-Belt herringbone speed reducer with a rather small ratio was recommended. The motor on the Claflin was 75 while a 125 h.p. motor was used on the larger Jordan engine. The motor speeds varied from 450 to 600 r.p.m. some of which were of the synchronous type. The refiners were to be driven at 335 r.p.m. the ratios being from 1.34:1 to 1.778:1.

A standard S-8 on the 75 h.p. motor and an S-10 Link-Belt herringbone speed reducer on the 125 h.p. motor were tried out. After these units operated for a short time it was seen that the application of the speed reducers produced a saving in power and an improvement in refinement far beyond expectation. It was found that this class of service required a greater margin of safety in the size of the gears and bearings and we will therefore detail in the following paragraphs a description of the SW-8 and SW-10 units which were designed to take care of this feature.

When it was decided that the change was to be made a specially designed reduction unit which included a special housing, wider gears, circulating pump, and cooling coils was recommended. The coil arrangement with a gear pump form a circulating system for the lubricant permitting the extraction of heat units from the oil. The coil serving to increase the radiating service.

The SW-8 and SW-10 units transmitting 75 and 125 h.p. respectively have a frictional loss of only 1½ to 2 per cent. The housing, however, is relatively small for the h.p. transmitted and would, without a cooling system, develop excessive temperature rise. A sufficient increase in the size of the unit to overcome such heating would be prohibitive both from the point of size and cost thus the present system was adopted.

A total of 17 reducers were installed on the refining engines manufacturing from the finest grade of glassine paper to the heavier grades made from rope and jute. After the reducers were installed an accurate record of the power consumed was made and over a period of four months operation the reducers effected a saving in power of approximately 25 per cent with the old type. Not only was there the saving of power, but also a considerable improvement in the grade of paper manufactured. This comparison was made with the processing of the pulp in the beater room remaining as constant as possible.

[1] Engineer, Link-Belt Co., Philadelphia, Pa.

Beating Treatment for Highly-Purified Wood Fibers

Information has been developed at the Bureau of Standards concerning optimum beating procedure for production of durable record papers from commercial highly-purified wood fibers made particularly for use in bond types of papers.

Through experimental paper-making tests, employing a 50-pound beater, it was found that a 7-hour beating period, with very gradual lowering of the beater roll, and a stock concentration of 4 per cent, gave the optimum results. Such treatment permitted gradual brushing out of the fibers without excessive cutting action or hydration. Details of the beater roll manipulation are given in the table. A light jordanning of the beaten stock appeared to be of advantage. Paper having a folding endurance of 3500 double folds and possessing cellulosic purity was produced by this beating procedure.

SCHEDULE OF BEATER-ROLL SETTINGS FOR BEATING HIGHLY-PURIFIED WOOD FIBERS

Heating Hours	Intervals Minutes	Position of roll [1]
0	0	10
0	15	10
0	30	4
1	0	2
1	30	1½
2	0	1
2	30	½
3	0	0
4	0	0
5	0	0
6	0	—½
7	0	—½

[1] Indicated as turns of the hand wheel with which the position of the roll relative to the bed plate is changed. At the — ½ setting the roll impinges on the bed plate, and at the zero setting the bed plate is just barely cleared. One turn of the hand wheel raises or lowers the roll 0.008 inch

A Practical Slowness Tester

By Arthur B. Green[1]

Since it first became possible to measure the slowness, or freeness, of paper stock, the test has been confined to the laboratory. Meanwhile there has been a great need for some way of making measurements of slowness quickly, on the beater room floor, independently of the skill of the laboratory worker. This can now be done. The new instrument does not immediately supplant the laboratory type of test. Certain variables of furnish, stock density, and temperature, can still be more accurately controlled under laboratory conditions than under the working conditions of the mill; therefore, in research and for purposes of fact-finding throughout impractical ranges of conditions, the investigator will have ample need for the laboratory type of instrument. But with progress in limiting the variations now uncontrolled in the management of the beater room, the practical mill type of instrument, such as will be described, overtakes the laboratory test in accuracy and surpasses it in sensitiveness.

Slowness is that property in paper stock which retards the rate at which the stock will part with water under given conditions. Slowness has importance for the paper maker in that it determines how wet the stock may be carried under the dandy or to the couch, how fast the machine may be run, what formation may be effected, what will be the drying efficiency, and so on. Slowness has another importance to the paper maker, not always so well recognized; that is, it may upset the calculations as to ream weight. Often it is assumed that stuff well regulated as to density on its way to the paper machine will result in fine control of ream weight and will relieve the machine tender from much grief and liability. But unless the stuff is also under control as to slowness, this assumption leads to disappointment, because other things being equal a slow stock will tend to heavy paper and free stock to light paper.

Whether the word "slowness" is used or "freeness" is a matter of choice. One is the opposite of the other. Slowness was apparently the first in the field, because in early efforts to measure it the interest lay in stocks where a good deal of slowness was sought. Later, when the laboratory measures of slowness came to be adopted in practice by the news and coarse paper mills, attention was turned to freeness, because that was generally in the interest of production. Since every operation through which paper stock passes makes it slower, not freer, it may seem more in line with logic to think of measuring the degree of slowness. That is why the term "slowness" is used here.

[1] Member TAPPI, consulting engineer, 249 Harris Ave., Needham, Mass.

FIG. 1

Methods in Use

Two types of laboratory test for slowness remain in the United States. One is the divided-funnel type; the other is the Skark type. These have been ably reviewed by Frederic C. Clark in a paper before the Technical Association of The Pulp and Paper Industry printed in the TAPPI section of PAPER TRADE JOURNAL, June 14, 1931, page 42. To make a test with either type of instrument, it is necessary first to take a sample from the beater, carry it to the laboratory, reduce it to a standard density by calculation, measure out an accurate quantity, perform the test according to well defined methods. Such factors as improper stirring, having the instrument out of level, taking an improper or unrepresentative sample in the first place, upset the results. Neither test can dispense with laboratory skill and care and the Skark type of test has the further disadvantage that the reading is by stop-watch operated on observed beginning and end points.

A third laboratory method, apparently not on the market, is the Heritage flow rate test. This is based on a further refinement of theory and elaboration of apparatus, and meets the objection argued against any form of drainage that the mat is forming while the test is going on. To have the mat building from nothing up to its maximum while measurements of the effluent water are being made, it is urged, introduces a variable of which no account is taken. Hence, Heritage takes his sample from the beater in the usual way, reduces it to a calculated density, measures out an accurate quantity, and from this makes a mat which he then holds between two standard screens, one above and one below the mat. Through this three-ply system he then drains clear water under a constant head, at a fixed temperature, and measures the rate of flow. The method is delicate, precise, consistent, a distinct contribution to laboratory technique; but it is more dependent on laboratory skill and care than even the divided-funnel type or the Skark type of drainage test.

The New Green Tester

The problem still remains, therefore, to put a dependable and sensitive measure of slowness in the hands of the beaterman himself. The Green automatic slowness tester which is now being made by the Bird Machine Company, South Walpole, Mass. (Fig. 1) is intended for that purpose. It is a little over two feet long, two and one-half inches in diameter, weighs four and one-quarter pounds, carries easily by a ring handle at the top. It is finished throughout in chrome to make it easy to keep clean.

In making a test, the instrument is simply plunged briskly into the stock at the beater up to the point where the ring handle at the top is just flush with the surface of the stock. It is allowed to ride in this position with the travel of the stock. Immediately the light spindle at the center rises. Its rise is rapid, then diminishing in speed, finally stopping. The whole interval of time up to the stopping point is not more than a few seconds. It remains at this stopping point until released; then it returns to its zero, or starting point. The reading is made by means of graduations marked in the surface of the spindle, and measuring the height to which the spindle rises. A slow stock will cause small rise, whereas a free stock will cause a great rise. The readings run from zero to sixty.

When the instrument is withdrawn from the stock, the water which has welled inside presses outward, and the mat of stock which has formed against the sides is washed away. The instru-

ment comes out almost completely cleaned. For this reason the screen, comprising the entire cylinder below the ring handle, seldom needs attention for cleaning, and repeated tests can be made over long periods of days without any accumulating error.

The instrument is self-timing. Inside the cylindrical screen is a centrally located solid tube of smaller diameter, open at the bottom. Water draining into the screen can enter this tube only at the bottom end. This action is rapid at first, then subsiding, according to the slowness of the stock. Hence, within the central tube there is a rising column of water, and this column rises first rapidly, then retards. In the same tube is a specially designed spinner which is attached to the spindle and is calibrated to sink in a still column of water within the tube at a predetermined uniform rate. When the rate of rise of the column of water in the tube during a test slows down to the rate of which the spinner would sink in still water, then the spinner comes to rest with respect to the tube, and the reading is taken on the spindle.

If unchecked, the spindle would rise to its stopping point and then proceed to fall, reversing its action. But the reading is the maximum point of rise. Hence, an automatic check is provided in the head of the instrument to hold the spindle at its top position until the reading is made, after which the operator releases the spindle and the instrument, being emptied by draining, is ready for the next test. More convenient and rapid than any other way of testing slowness, readings may be repeated three or five times and an average taken for the determination, a thing hardly within the scope of the laboratory types of instrument.

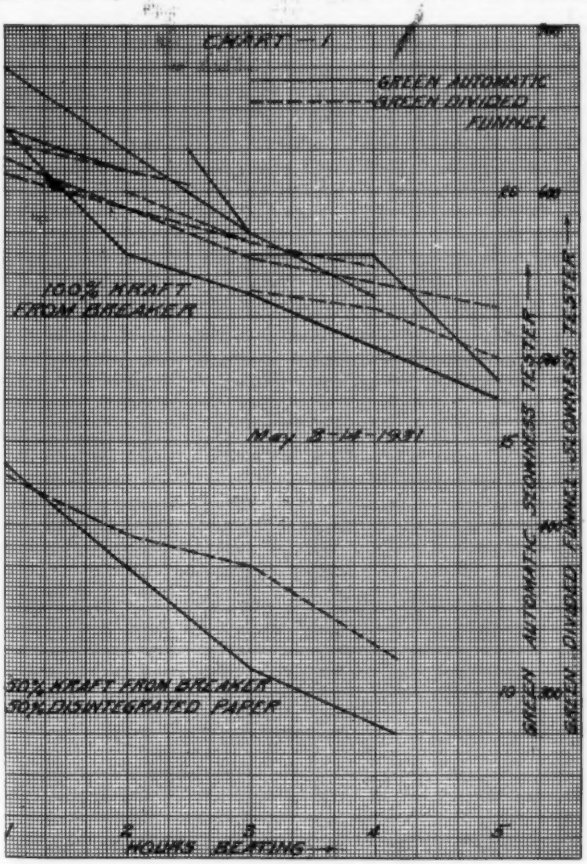
The instrument comes apart completely, so that it may be inspected throughout at will. It should be kept wet in practice, not allowed to dry out between tests. Preferably it may be steamed or scoured out, making sure that nothing is sticking to the tube or spinner. A vent at the top provides for this without disassembling. The care of the instrument is extremely simple. Its accuracy in stuff of beater density results from the fact that its entire outer surface is perforated, instead of a limited area of perforation as found in the laboratory instruments. The drainage is from without inward and from below upward, instead of the reverse which has been customary. The uniformly sinking spinner provides the self-timing element corresponding to the standardized bottom orifice under constant head found in the divided-funnel type.

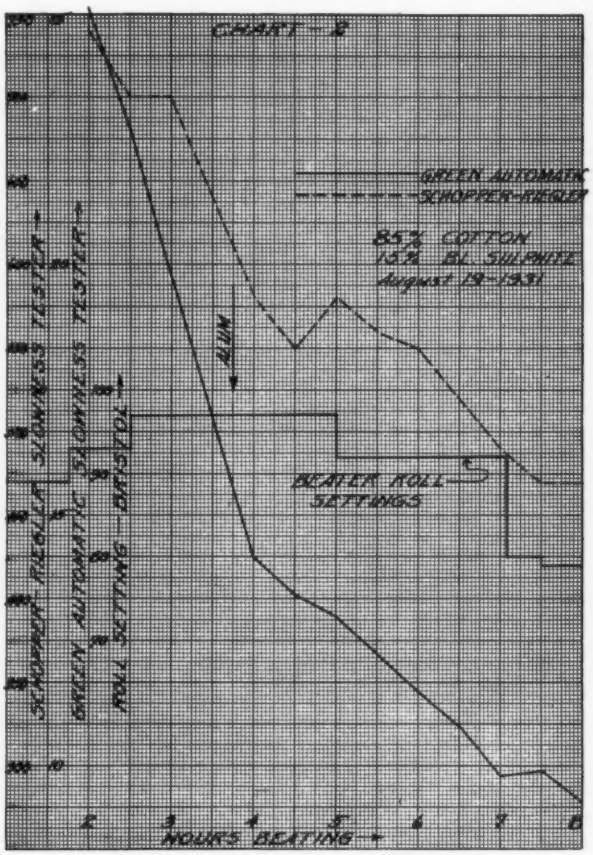
Comparative Tests

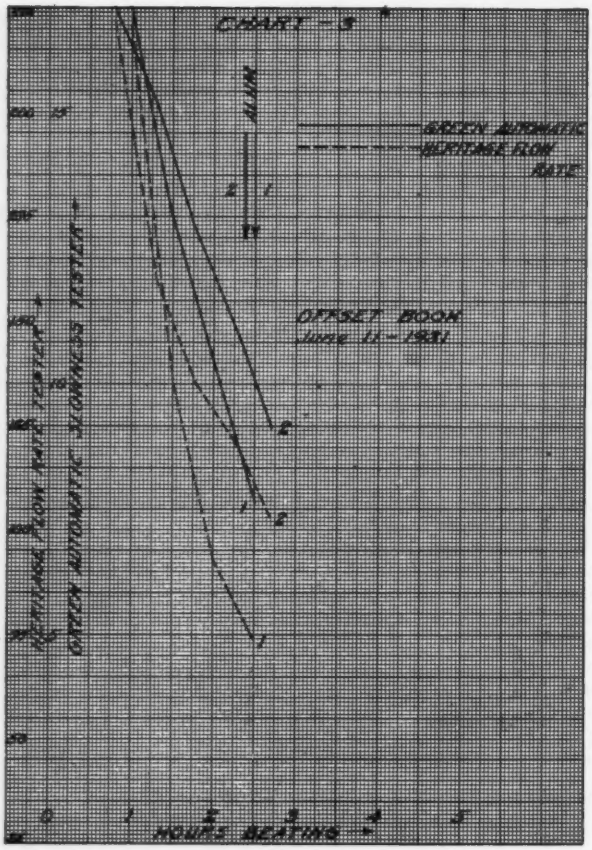
From among the tests that have been made with this instrument, four charts have been prepared which compare the action of the Green automatic tester with that of other slowness tests. These tests were made in mills under practical mill conditions while the measurements according to laboratory tests were made by the laboratory staffs of the mills.

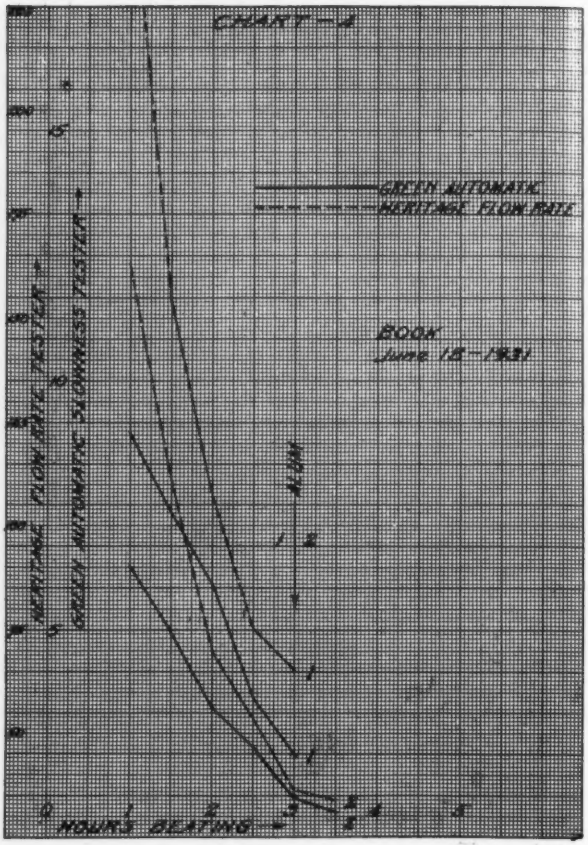
Chart 1 compares the Green, automatic with the original Green slowness tester of the divided-funnel type, not now on the market. The stock is that of a boxboard mill, including two grades. The chart shows the remarkable agreement between the two ways of testing slowness, with the odds in favor of the Green automatic in point of sensitiveness. In other words, the Green automatic reveals more change in slowness during the course of the beating.

Chart 2 compares the Green automatic with the Schopper-Riegler divided-funnel type of instrument, the stock being that of a fine writing mill. This covers a relatively long beating period and shows in addition the settings of the beater roll relative to bedplate as recorded by a Bristol recorder. In justice to the divided-funnel type of instrument, it should be said that the one used in this mill had a sagging screen made of fourdrinier wire, impossible to level, and complicated in action by the factor of surface tension in the outflowing water. The divided-funnel principle is properly applied by having a flat and level screen.









The comparison shows a greater sensitiveness for the Green automatic and a smoother curve. The combined effect of alum and later of raising the roll are pictured in both curves, but more smoothly and more immediately in the lower.

Chart 3 compares the Green automatic with the Heritage flow rate on a book furnish composed of bleached sulphite, bleached soda, and disintegrated paper. The beating period is very short, still the changes made in slowness are significant and extremely important to know. As to form, both tests show the same relation between the two beaters. The Heritage flow rate is the more sensitive.

Chart 4 compares the same two testers again, this time on another book furnish. Here the effect of alum is clearly seen in both curves. As to form, both instruments reveal the same differences between the two beaters. The Heritage flow rate is again the more sensitive.

Except for the flow rate test, which is highly refined and extremely technical, the Green automatic equals in accuracy and surpasses in sensitiveness the laboratory types of slowness test. It thus places laboratory precision within the reach of the ordinary man. It is quick in action, simple in construction, a handy and inexpensive beater room tool.

New TAPPI Members

Charles H. Herty is a well known industrial consultant and is at present director of the experimental pulp and paper laboratory of the State of Georgia, at Savannah, Ga. Doctor Herty attended the University of Georgia and received his Doctor's degree from Johns Hopkins University in 1891. From 1891-1902 he taught chemistry at the University of Georgia. From 1901-1904 he studied turpentine with the U. S. Bureau of Forestry. 1904-1905 was devoted to perfecting the turpentine cup for the Chattanooga Pottery Company. From 1905-1916 he taught at the University of North Carolina. From 1916-1921 he was editor of the *Journal of Industrial and Engineering Chemistry.* From 1921-1926 he was president of the Synthetic Organic Chemical Manufacturers Association. From 1926-1928 he was advisor to the Chemical Foundation Inc. and since then he has been a general industrial consultant. Doctor Herty has written many papers on naval stores in scientific journals and in February 1929 he spoke on "Future Possibilities in the Production of Cellulose," at the meeting of the American Paper and Pulp Association in New York.

Louis A. Korte, chemist of the Dexter Sulphite Pulp and Paper Company, Dexter, N. Y., is a 1931 graduate of the New York State College of Forestry, Syracuse, N. Y. Mr. Korte has had experience as a chemist and operator at the Racquette River Paper Company, Potsdam, N. Y., and the Oswego Falls Corporation, Fulton, N. Y.

Herbert Prelinger, research chemist of the Crown Willamette Paper Company, Camas, Wash., is a 1922 graduate chemical engineer of the Graz Technical University in Austria. Since then he has been chemist for Lieb & Co., consulting chemists, Vienna, Austria; chief chemist of Leykana Josephsthat Cellulosefabrik in Gratewein, Austria, plant manager of Dungs & Schuster ink manufacturers, Long Island City, N. Y. and chemist of the Central Commercial Asphalt Company, Baltimore, Md.

Gustav Soderlund has been mill superintendent and manager of Holmes Bruks A/B, Norrkoping, Sweden for eighteen years. He graduated as a mechanical engineer from the Technical University of Stockholm, in 1913.

Alexander Weinstein, is general manager of the Hamersley Manufacturing Company, Garfield, N. J., with whom he has been associated for six years. Mr. Weinstein studied at Columbia University and has been a consulting engineer since 1920.

Uses of Cellulose Other Than for Paper*

By Edwin C. Jahn[1]

Introduction

Before this group it is unnecessary to enumerate the many products made from cellulose nor to go into details concerning their manufacture. Many popular articles have appeared describing the versatility of this raw material, and we have read from time to time that this is the "Age of Cellulose"—if it is possible that any one material can be the basis for our modern complex civilization.

Although pictures of the great variety of cellulose products are inspiring and accurate they are apt to lead to certain fallacies. To the uninformed cellulose appears to be convertible to our every need, and chemists are looked upon not as research workers but as miracle workers. It is true that our modern cellulose products are extensive, but they are the fruit of years of painstaking research, and even yet the nature of the cellulose molecule remains problematical.

This discussion will be confined to a brief outline of, first, the major or fundamental manufacturing processes using cellulose; second, the constitution of cellulose and its relation to the products formed, and finally, the indications for and against an expansion in the use of wood cellulose.

Although cellulose finds many uses in the "unliberated" state, such as in lumber, in wood distillation, and in hydrolysis and fermentation, these uses will not be considered here. We will take up only the uses of cellulose from any plant source in the pure or relatively pure state.

Processes for the Manufacture of Cellulose Products

When we come to consider the fundamental processes underlying cellulose products we find that they are relatively few. They are (1) delignification or liberation of cellulose fibers, (2) solution and regeneration of cellulose, and (3) esterification or etherification of cellulose. (Fig. 1.) As a result of the first method we have pulp for paper, fiber boards, vulcanized fiber and a raw material for the second and third processes just mentioned. The viscose, cuprammonium, and nitrate methods of synthetic silk manufacture come under the second process. The cellulose acetates, nitrates, and ethers are the result of the third process.

These last two basic processes underlie the manufacture of synthetic fibers, Cellophane, films, lacquers, cellulose plastics and the cellulose nitrate explosives. They are the foundations for most of our cellulose products other than paper, and because of their practical importance and their growing relation to wood cellulose it may be of interest to outline briefly the chemistry that they involve.

Regenerated Cellulose Products

Viscose Process. The viscose process which continues to be of prime importance for the manufacture of synthetic fiber was discovered in 1893 by Cross and Bevan, two famous names wherever cellulose is concerned. They found that when cellulose was impregnated with a mercerizing solution of caustic soda, and then treated with carbon bisulphide, it became soluble in water as a thick yellow syrup. When in this condition the cellulose is in combination with the sodium and CS_2 as sodium cellulose xanthogenate, theoretically formed as follows:

$$(C_6H_{10}O_5)_x + x\ NaOH \rightarrow (C_6H_9O_4 . ONa)_x + x\ H_2O$$
$$C_6H_9O_4 . O\,Na + C\,S_2 \rightarrow C_6H_9O_4 . O . CS . S\,Na$$

If this viscous solution is kept or "ripened" for the proper period of time and then passed into solutions of certain salts or acids the cellulose is regenerated in a modified form.

Cross and Bevan considered using viscose solutions for coating fabric fibers, and it remained for others to apply the process to film and fiber manufacture.

In rayon manufacture the viscose solution is ejected through spinnerets into the precipitating bath, the latter usually containing about a 10 per cent solution of sulphuric acid together with some sodium sulphate. Each spinneret usually made of a gold-platinum alloy, is a flat cup of about the size of a thimble and has a number of fine openings (0.09 mm. diameter) varying approximately from 10-40 in number. Each opening forms a filament and all the filaments from one spinneret are united to form a thread.

Through mechanical invention the viscose process has become versatile. Thus if the viscose is pressed through thin slits we obtain cellophane sheets which are rapidly expanding their use as wrappers for foodstuffs, tobaccos, and other articles for sale. Artificial straw braid and horsehair are also made. These are used for millinery and upholstery, respectively. Artificial wool from rayon is not yet a complete success. The fibers are too smooth, and elaborate methods must be used to impart the crinkle.[1] Seamless regenerated cellulose tubes for sausage casings are successfully produced.[2] Fruit is sometimes given a continuous cellulose coat by a dipping process.[3] There is no reason to doubt but that the viscose process will be turned to still further uses.

Cuprammonium Process. A second method for the manufacture of regenerated cellulose synthetic fibers is Pauly's method in which 5-10 per cent of cellulose is dissolved in Schweitzer's reagent (cuprammonium hydroxide) and regenerated in an acid or caustic bath. During coagulation the threads are subjected to tension which stretches them, producing fine filaments. These filaments are also known under the German word Glanzstoff, meaning lustre silk. The Pauly process is especially adapted for finer filaments and it is possible to produce them 2.5 times finer than true silk. It requires more than 4225 miles of one of these filaments to weigh a pound.[4] Cuprammonium silks have a greater resistance to water than other synthetic fibers and hence have

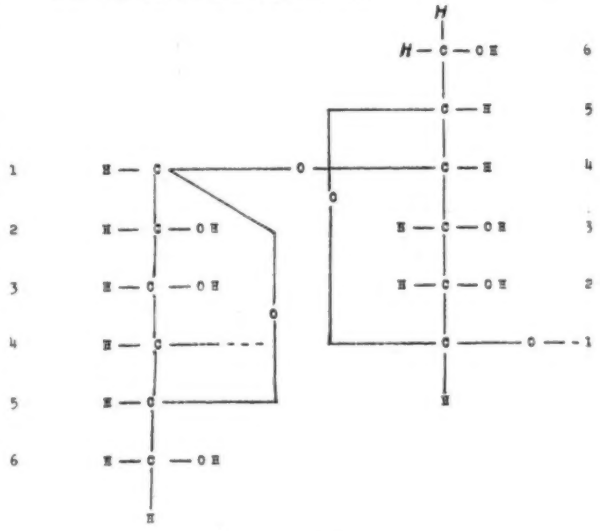


Fig. 1

* Presented at the fall meeting of the Pacific Section of the Technical Association of the Pulp and Paper Industry at Powell River, B. C., Oct. 23, 1931.

Contribution of the TAPPI Fibrous Raw Materials Committee.

[1] Member TAPPI, Assoc. professor of forestry, University of Idaho, Moscow, Idaho.

[1] R. H. McKee, Cellulose 1, 157, 1930.
[2] W. F. Henderson, Cellulose 1, 153, 1930.
[3] N. Klein, Cellulose 1, 207, 1930.
[4] C. E. Mullin, J. Chem. Ed. 7, 1811, 1930.

greater wet strength. These properties overcome the disadvantage of high manufacturing costs.

NITRATE PROCESS. The oldest method of synthetic fiber manufacture is that employing cellulose, esterified by nitric acid and then regenerated as a modified cellulose. de Chardonnet in 1885 was the first to overcome the practical difficulties of synthetic fiber manufacture and patented a process using collodium, which is a cellulose nitrate containing 11.2-11.7 per cent N.

Briefly the method consists in nitrating cotton cellulose with, for example, a mixture of about 48 per cent HNO_3 and about 28 per cent H_2SO_4 which forms a mixture of cellulose nitrates. $[(C_6H_{(10-n)}\ O_{(5-n)})\ (NO_3)_n]_x$. When the nitration of purified cellulose is carefully carried out the value of n approaches 3, which is the theoretical value for cellulose trinitrate. After washing, the cellulose nitrate is dissolved in equal volumes of alcohol and ether, aged, and then pressed through fine capillaries into a current of air which remove the solvents and leaves a filament of cellulose nitrate. Cellulose nitrate is exceedingly inflammable so that it must be denitrated. This is done by passing the thread through a solution of sodium acid sulfide NaHS.

The nitrate process produces a lustrous fiber, but because of the operating risks due to inflammability, expense of operation, and difficulty in effecting complete denitration, the method appears to be losing ground.

Cellulose Esters and Ether Products

CELLULOSE ACETATES. Cross and Bevan were the first to prepare cellulose acetate. They heated cellulose with acetic anhydride at high temperatures. When the reaction is carefully carried out a pure cellulose triacetate is formed, the three available hydroxyl groups in cellulose being occupied by acetate groups.

The general commercial practice is to acetylate with acetic anhydride containing sulphuric acid or sulphur dioxide as a catalyst, and in the presence of glacial acetic acid to dissolve the triacetate produced. The solution containing the triacetate is then diluted with water until the glacial acetic acid and the anhydride have been converted to acetic acid of 90 to 95 per cent strength. On standing 10 to 12 hours, partial hydrolysis occurs producing a mixture of acetates approximating the diacetate. This step is necessary in order to produce an acetone soluble product. The acetic acid solution is then poured into water which precipitates the cellulose acetate. This is washed and dried.

For the production of fiber, the cellulose acetate is dissolved in acetone, the solution filtered, and ejected through spinnerets into a warm air current which removes the solvent leaving a cellulose acetate filament.

The non-inflammability of cellulose acetate is one of its most important properties. This led to its development as a lacquer for airplane surfaces during the war. It is also used to a small extent to produce safety film, and for toys and wrappers.

It is stated that in France considerable amounts of this ester are used for safety glass. Its stability to sunlight and heat are favorable properties for this use, but its poor adhesion and brittleness argue against it at present.

The toughness, water resistance, heat resistance and easy thermoplastic production of translucent or mottled products are properties of cellulose acetate which make it suited for plastics. This field is limited only by the difficulty of finding a suitable plasticizer.[5]

The production of cellulose acetate fiber, also called celanese, is by far the most important of the cellulose acetate industries. The growth of this industry is very recent and rapid. The U. S. A. production has risen from less than 0.5 million pounds in 1924 to over 7 million in 1929, and with 10 million pounds estimated for 1930. For plastics and films about 0.5 to 1 million pounds were used in 1929.[6]

CELLULOSE NITRATES. The cellulose nitrates were the first cellulose derivatives to attain any important commercial use. Braconnot in 1832 was the first to make cellulose nitrate, but it remained for Schoenbein in 1846, who independently prepared cellulose nitrate, to actually put it to technical use as an explosive.

Distinction must be made between two classes of cellulose nitrates—collodion cotton or pyroxylin, and gum cotton. The former is a mixture of mono-, di- and tri-nitrates containing between 10.7-12.4 per cent N. It is used for films, lacquers, plastics, and for the nitrate silk process already described. Gun cotton is a mixture of nitrates containing over 12.5 per cent N, approaching the tri-nitrate, collodion is soluble in ether-alcohol, whereas gun cotton is not.

The properties of the cellulose nitrate and the percentage of nitrogen introduced are influenced greatly by the kind and purity of the cellulose used, by the concentration of the nitric acid used, by the amount of sulphuric acid used, and by the temperature at which the reaction is carried out.

For pyroxylin or collodion, nitration is carried out for about 20 minutes with, for example, an acid mixture of 47.6 per cent HNO_3 and 28.1 per cent H_2SO_4. For gun cotton the cellulose is treated in centrifugals or by a displacement method for about 2½ hours with an acid mixture in the neighborhood of 71 per cent H_2SO_4, 21 per cent HNO_3, 7.5 per cent H_2O and 0.5 per cent HNO_3 impurity.[7] The temperature is carefully controlled and is kept at lower ranges (15 to 25 deg. C.) for higher nitration products, and above this (up to 40 deg. C.) for the lower nitrates (collodion cotton).

It is remarkable that the fibrous character of the cellulose is retained, as is to a large degree the strength of the fiber after being nitrated. It seems that the cellulose molecule or fiber framework itself is not affected by the process.[8]

Pyroxylin or collodion cellulose nitrate finds a large and growing use for lacquers, photographic films, plastics (celluloid), safety glass and artificial leathers. Slight variations in nitrogen content and viscosity cause considerable changes in properties. By using a standard viscosity test it is possible to classify the cellulose nitrate for its most suitable use. For example, low viscosities are best suited for various types of lacquers, the higher viscosities for artificial leather, waterproofing compounds, airplane dopes, gas mantles, belt and film cements, and other products.[9] The different properties are produced by the type of cellulose used, and by variation in nitration and purification processes. It is a comparatively recent development (1919) that a sufficient knowledge of viscosity characteristics has been obtained to allow the manufacture of a cellulose nitrate below a limiting viscosity, and this discovery marked the beginning of the modern lacquer industry.[10-11]

Cellulose nitrates with a nitrogen content of over 12.5 per cent (gun cotton) are used for explosives. For smokeless powders the nitrate after washing is boiled with water, and then shredded to short fiber lengths in a beating engine. After expressing the water the cellulose nitrate is treated with alcohol, and then ether added. The soft mass is sieved, then forced through dies forming jelly-like rods from which the solvent is removed by evaporation.

CELLULOSE ETHERS. The practical use of cellulose ethers is still largely in the experimental stage. However, a review of the recent patent literature reveals increasing interest in these products. The ethyl and benzyl ethers seem particularly promising and they are reported producible at costs which may soon enable them to complete with the cellulose esters.

Various other cellulose esters are also being investigated, such as the formates, propionates, butyrates, benzoylates, and mixtures of these with ethers, producing mixed cellulose ester ethers.

---

[5] C. J. Staud, Cellulose 1, 166, 191, 1930.
[6] E. C. Partridge, Ind. Eng. Chem. 23, 482, 1931.
[7] Riegel, Industrial Chemistry, pp. 417, 444 (Chem. Cat. Co., N. Y., 1928).
[8] E. Heuser, Textbook of Cellulose Chemistry, Trans. by West & Esselen, p. 35 (McGraw-Hill, New York, 1924).
[9] E. P. Partridge, Ind. Eng. Chem. 21, 1044, 1929.
[10] M. J. Callahan, J. Chem. Ed. 7, 1821, 1930.
[11] M. G. Milliken, Ind. Eng. Chem. 22, 326, 1930.

These various compounds are reported suitable for synthetic fibers, lacquers, films, phonograph records, etc.[13]

The Constitution of Cellulose and Its Relation to the Products Formed from It

This paper is not intended to discuss the constitution of cellulose. However, it is desirable to point out a few examples which indicate how intimately the properties of certain cellulose products are related to the physical and chemical nature, and to the purity of the cellulose originally used.

The term "pure cellulose" is ambiguous since we lack the usual criteria for the judgment of its purity. Cellulose must be isolated as a residue by delignification or purification. It cannot be crystallized, has no sharp melting point, nor exhibits any of the properties enabling its isolation and identification by the usual organic chemistry methods. The chief difficulties in our study of cellulose are that it is not macro-crystalline and that it shows colloidal behavior in solution. Furthermore, different methods of isolation and different means of purification cause appreciable variation in certain of its properties, as, for example, viscosity in cuprammonium solution.

There are, however, certain definite facts which we know regarding cellulose and which appear to be constant for all purified "celluloses." These are briefly:

(1) Cellulose, $(C_6H_{10}O_5)_x$ hydrolyzes practically quantitatively to glucose.
(2) Esterification and etherification show that 3 available hydroxyl groups are present per C_6 unit.
(3) On methylation a trimethyl cellulose is formed, which on hydrolysis yields only 2, 3, 6 trimethyl glucose.
(4) Acetolysis converts 40-50 per cent of the cellulose into cellobiose actaacetate

From this data cellulose is known to be composed of anhydroglucose units, joined by glucosidic linkages apparently at carbon atoms Uo. 1 and No. 4 as indicated in Fig. 2.

Whether the cellulose molecule contains many anhydroglucose units in a long chain or whether it is a relatively small molecule, which becomes aggregated or associated into larger units or micellae is still problematical. In either case the molecules or aggregates are apparently not of uniform size, but are variable. In short, cellulose may be considered as a solid solution of its polymers.

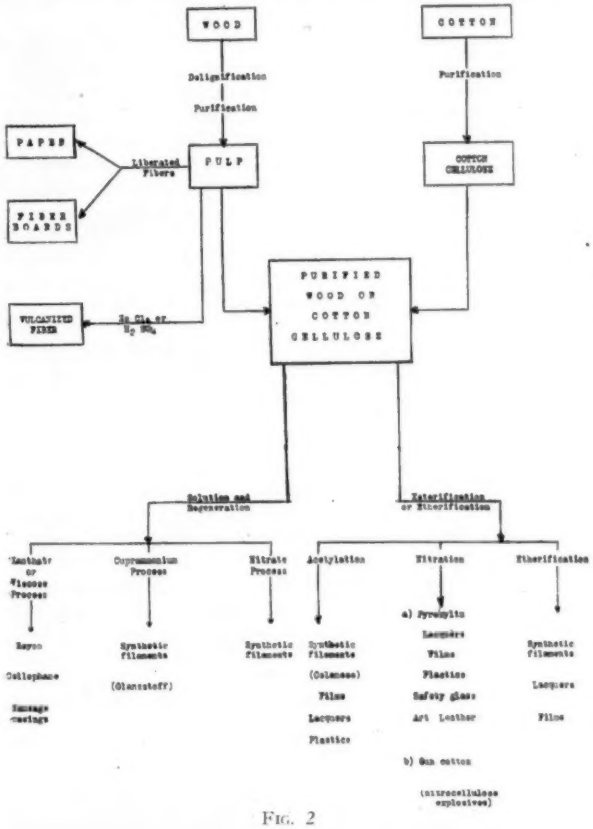


FIG. 2

Although we may accept the hypothesis that cellulose from all sources is one and the same chemically, there are nevertheless certain differences between cotton and wood cellulose which apparently are mostly physical or physical-chemical. These differences cause considerable variations in certain cellulose products depending upon whether they are made from cotton or wood. Synthetic yarns from different celluloses are not identical in their properties[4], the physical characteristics of cellulose films vary somewhat with the kind of cellulose used, and there is a difference of opinion as to the relative stability and degree of nitration of wood nitrocellulose as compared with cotton nitrocellulose.[13]

The water absorption values obtained for isolated wood cellulose differ from those obtained for cotton cellulose. Pidgeon and Maass[14] state that "cotton cellulose is fundamentally different from the cellulose in wood; this is brought out by the absorption curves not coinciding over any portion of their length."

The most marked difference between cotton and wood cellulose is in the viscosity of their solutions or solutions of their esters. There is a direct relation between the viscosity of cellulose in cuprammonium solution and that of their ester derivatives.[15] Furthermore, the viscosity of both cellulose and of cellulose ester solutions can be reduced in a number of ways as by heat, by alkalis, acids or oxidizing agents. Also cellulose isolated or purified by different methods exhibits differences in viscosity. It seems most probable that these facts are bound up with that of the molecular or aggregate size of cellulose or the arrangement of the micellae in the fiber. Purification, isolation, or chemical action can apparently vary the molecular status. Thus, it is probable that the drastic methods of isolation of wood cellulose have an effect upon the molecule or aggregate size; e.g., wood cellulose in situ may or may not be identical with cotton cellulose.

Recent experimental evidence on the molecular size of cellulose indicates the correctness of some of the above ideas. Stamm[16] by the use of ultracentrifuge methods has been able to determine the particle size or molecular weight of cellulose in cuprammonium solution. Cotton cellulose was found to have a molecular weight of 40,000±5,000, corresponding to 200 to 260 anhydroglucose, $C_6H_{10}O_5$, units. Wood celluloses[17] show the presence of a material of the same molecular dispersion as cotton cellulose together with a material of one half its molecular weight, and molecular species of still finer dispersion. Stamm states that, "the data thus indicate that the difference between isolated wood cellulose and cotton cellulose dissolved in cuprammonium solvent is at least partially a matter of difference in the degree of association of similar structural building units."

Indications For and Against an Expansion in the Use of Wood Cellulose

The factor which dictates the use of a raw material for new industries or its expansion in competition with other materials in established industries is largely one of economics. This discussion will not enter into the economics of the case, but will merely indicate some of the trends as well as some of the possibilities which may operate for or against an expansion in the use of wood cellulose for purposes other than paper.

First let us consider some of the possible factors which may decrease the use of wood cellulose. Some of these are purely speculative, others are now competing with pulp. Among the latter is cotton.

[13] H. Dreyfus, Brit. Pat. 324,662, Sept. 24, 1928; Imperial Chem. Industries, Ltd., & D. Traill, Brit. Pat. 327,714, Oct. 3, 1928; W. H. Gloves & C. Diamond, U. S. Pat. 1,763,428, June 10, 1930; and others.
[14] R. G. Woodbridge, J. Chem. Ed. 7, 1832, 1930.
[15] L. M. Pidgeon & O. Maass, J. A. C. S. 52, 1053, 1930.
[16] Gibson, J. Chem. Soc. 119, 479, 1920; Small, Ind. Eng. Chem. 17, 515, 1925.
[16] A. J. Stamm, J. A. C. S. 52, 3047, 1930.
[17] A. J. Stamm, J. A. C. S. 52, 3062, 1930.

Cotton has certain obvious advantages over wood cellulose. It contains 95 per cent alpha cellulose, is easy to purify and process, and does not contain small amounts of mannan and pentosans as does alpha wood cellulose. Cotton has maintained supremacy in the cellulose nitrate and other ester industries, but supplies only about one-third of the raw material for the viscose process in the United States. It is pointed out, however,[18] that the cheaper short fibered cotton is as suitable for the cellulose industry as the longer fibered expensive cotton. It may be possible to bring the average yield per acre from 165 pounds to 500 pounds for this material.

Competition from agricultural wastes has often been held as a menace to the wood pulp industry, particularly for fiber board and paper manufacture. Success has been attained in the manufacture of certain wall and insulating boards from straws and sugar cane residue. There is no doubt but that for fiber boards and even for paper in certain areas (despite the recent failure of the cornstalk paper plant in the Mid-west)[19] we may expect more or less competition with wood pulp.

Rommel[20] points out that from the cornstalk cellulose producible in one Iowa county all the rayon manufactured in 1927 in the United States could have been made, and that if necessary all the paper now made in the United States could be produced from the cornstalks now wasted.

There are, however, several obvious advantages of wood over annual crops as a source of cellulose. They are:

(a) Low yield and poorer quality of fiber as compared with wood. Wood fiber has invaded the field of high grade papers and also the rayon field.

(b) Low per acre yield of annual crops. Compared with 100 pounds of 1st grade cellulose from flax and 165 pounds of cotton there is an average annual increment of wood growth in managed forests yielding 2000 pounds of cellulose per acre.[21]

(c) Ease of transportation and storage of wood, its resistance to decay, ease of handling, and digester output as compared with field crops.[22]

(d) Crops must be harvested annually involving storage and decay difficulties. The collection of the material involves many small producers. Wood has no forced harvesting. Also it can be grown on a large scale, the transactions passing but few hands.

Furthermore cheaper pulping processes for wood are making possible the cheap production of crude wood fiber, which in the form of fiber boards compete with any similar material made from agricultural wastes.

The supply and abundance of wood as a raw material and its yield per acre may be greatly augmented by means of hybridization. Recent experiments with poplars indicate that the rate of growth, size of tree, shape of tree, and even fiber length can be improved.[23] It has been found that some of the hybrids put on as much as 10 to 14 times as much wood per year as the common wild poplars. It is expected that with these trees the cellulose production per acre-year would be 8,000 pounds. Trees growing so quickly can almost be considered an agricultural crop without the uncertainties of annual plants. They can be left growing until wanted and still continue to increase in size.

Entering into more purely speculative considerations, we may find that new processes in the future may compete with wood pulp. For example if it were possible to dissolve out directly, or otherwise remove cellulose from wood, for the viscose and cellulose ester industries, sawdust and wood waste could be utilized for this purpose.

Another fascinating piece of speculation is the possibility of producing synthetic cellulose from carbon dioxide and water or from other sources. This possibility has been given new life by the papers of Hibbert[24] at the Buffalo meeting of the American Chemical Society in September. Hibbert described the synthesis of cellulose from glucose and then the production of synthetic textile fibers from the synthesized cellulose. Such an accomplishment is of great theoretical interest and may serve as a means for the better understanding of the cellulose molecule.

Even though it may be possible to produce synthetic cellulose, it will have to compete with our reserves of naturally grown cellulose at hand. Better forest management and improved pulping processes will continue to cut down production costs.

The development of new processes and new products from cellulose will of course increase the market for wood pulp. However, pre-genital processes offer little basis for discussion. But experimental evidence indicates certain developments in existing processes which are of importance.[25]

Perhaps the most promising development is in the production of high alpha fiber for rayon and other chemical cellulose products. The recent patent literature on alpha-fiber is appreciable, and numerous general articles on the subject have recently appeared.

The basis for the purification of wood pulps is a mild alkaline treatment, usually with heat. Most of the patents rely on this treatment and differ only in details. In some cases an oxydizing or bleaching treatment is also used. High alpha kraft pulps (up to 97 per cent) have been obtained by treatment with alkaline oxidizing (bleach) solutions.[26]

Alpha pulps containing as high as 98 per cent alpha cellulose, and thus comparable to cotton, have been prepared. Wood alpha pulps, however, show a lower viscosity than cotton cellulose. This, as previously pointed out, is probably due to the drastic chemical treatment given wood cellulose.

Wood pulp has already entered the rayon field. Here, however, a comparatively large latitude in alpha cellulose content and purity is allowable. Yet, with an improved purity of wood cellulose a better rayon at lower cost is producible. The manufacture of such improved alpha cellulose will probably increase the use of wood cellulose in the rayon industry.

The specification requirements for cellulose for the cellulose nitrate industries are far more stringent than for viscose. The principal objection to wood cellulose for pyroxylin seems to be its physical character, yet means might be devised for overcoming this objection. The lower viscosity of wood alpha cellulose should not be objectionable for pyroxylin, but on the contrary should be a favorable property. The low viscosity type of cellulose nitrates for lacquers is the basis for most of the lacquer products. Lacquer films made from high alpha wood pulps have been shown to have equal qualities with those made from cotton.[10]

It appears that research on the improved quality of wood cellulose in relation to lacquers, explosives, and cellulose acetate should open these processes to the use of high alpha wood fiber.

The synthetic fiber and cellulose ester industries are rapidly growing and will demand increasing amounts of cellulose. The cellulose acetate fiber industry is growing at an amazingly rapid pace. It appears to be undergoing radical developments involving changes in acetylation methods and solvents used which may bring down the price appreciably. Cellulose acetate may also enjoy a growth in use for films and plastics. Although cellulose acetate can be made from wood cellulose it is commercially manufactured from cotton. Investigation of the proper treatment of wood cellulose should enable it to meet the requirements of the cellulose acetate process.

The development of a synthetic wool of satisfactory qualities and the introduction of other cellulose ester and ether products will all contribute to an increased use of cellulose.

Although the quantity of cellulose used by these industries is small compared to that consumed by paper, they would nevertheless be a welcome additional market for wood pulp.

[18] F. C. Vilbrandt, Cellulose 1, 210, 1930; M. W. Weiss, Cellulose 1, 251, 1930.
[19] P. P. Mag. Can. 31, 858, 1931.
[20] G. M. Rommel, Ind. Eng. Chem. 20, 716, 1928; Cellulose 1, 13, 1930.
[21] G. M. Rommel, Ind. Eng. Chem. 20, 494, 1928.
[22] Schorger, P. T. J. 89, Tech. Sec. 238, 1929.
[23] R. H. McKee, Cellulose 1, 188, 1930.
[24] Ind. Eng. Chem. News Ed. 9, 273, 1931; See also H. Hibbert & J. Barsha, J. A. C. S. 53, 3907, 1931.
[25] See for example A. W. Schorger, Cellulose 1, 248, 1930; G. A. Richter, Ind. Eng. Chem. 23, 131, 266, 371, 1931; L. I. L. Durchman, P. T. J. 92, Tech. Sect. 276, 1931; J. Rossman. Tech. Assoc. Pap. XI, 187, 1928.
[26] Richter, U. S. Pat. 1,773,320, 1930; U. S. Pat. 1,774,403, 1930.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

For photostatic copies of articles appearing in the Abstract Section, address the chairman of the Abstracts Committee, Dr. Clarence J. West, National Research Council, 21st and B Streets, Washington, D. C. The charge for this service is: Photostats 9 x 11 inches, 18 cents each; 18 x 11 inches, 35 cents each; 22 x 18 inches, 70 cents each; minimum charge, 50 cents. Payment should be made upon receipt of invoice. Copies of United States patents may be obtained from the U. S. Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Machinery

Paper Corrugating Machine. Karl Sieg assignor to Samuel M. Langston Co. U. S. pat. 1,810,930, (June 23, 1931).—A feed mechanism is provided between the supply roll and the corrugating rolls, and the feed mechanism is driven through a slip friction connection which is adjusted so as to be slightly less than the friction of the brake on the supply roll. The feed alone is unable to exert sufficient pull on the paper to rotate the supply roll, but the corrugating rolls and feed rolls acting in series are sufficient to turn the supply roll and the tension on the paper between the corrugating and feed rolls is very much less than between the feed rolls and supply roll. This permits of greatly increasing the speed of the corrugator with less liability of cutting or breaking the paper.—A.P.-C.

Paper Specialties

Coated Paper. N. W. Powter. Alliance Paper Mills, Ltd., Toronto. World's Paper Trade Rev. 96: 874-880 (Sept. 11, 1931).—A discussion of the mechanism of the cracking of coated paper when folded and of how to prevent this trouble, showing more particularly the importance of correct moisture content.

Synthetic Lumber from Cornstalks. Orland R. Sweeney assignor to Iowa State College of Agricultural and Mechanical Arts. U. S. pat. 1,803,737 (May 5, 1931).—Unshredded cornstalks are cooked in water, discharged from the cooker and disintegrated by milling and then formed into lumber by a suitable machine.—A.P.-C.

Machine for Producing Insulating Board. Orland R. Sweeney assignor to Iowa State College of Agriculture and Mechanical Arts. U. S. pat. 1,814,268 (July 14, 1931).—The machine bears some resemblance to a fourdrinier machine, having a main frame supporting at one end the breast roll, which, together with table rolls and other parts support the forming wire, which passes from the breast roll over table rolls and then suction boxes, and then between press rolls. The stock is fed to the wire through a distributing nozzle. The chief feature of the machine is that the wire does not follow a straight line from the breast roll, but instead follows a roughly logarithmic curve from the breast roll over the table rolls and the tops of the suction boxes to the presses. It is claimed that the mat of pulp produced by following this curve is so completely interlaced that the strength of the board is much greater, the texture finer, and the insulating properties generally better than would be the case if the curve were not followed.—A.P.-C.

Colored Papers. I. G. Farbenindustrie Aktiengesellschaft. Fr. pat. 701,749, (Sept. 6, 1930).—Colored papers are coated with polyvinyl esters of organic acids.—A.P.-C.

Process of Making Insulating Board. William H. Mason assignor to Masonite Corp. U. S. pats. 1,812,969 and 1,812,970, (July 7, 1931).—No. 1,812,969—The insulating board covered by this patent has the interior or backing portion of relatively high porosity, making a good insulator, and one or both surface portions hard, dense, stiff and strong, both the interior and the surface portions being produced from an integral body of fiber. Pulp containing practically the woody material and the lignins (preferably prepared by the Mason explosion process) is formed into a felted sheet and is then subjected, in moist form, to heat and pressure in a hydraulic press. One or both plates of the press are heated, according as one or both surfaces are required to be dense and hard. After the welding of the fibers together by heat has progressed inwardly as far desired, the application of heat is cut off, while the pressure is maintained; and finally the pressure is released. No. 1,812,970—Fiber (preferably prepared by the Mason explosion process) in which most of the lignin has been retained, is given a slight degree of refining (if desired) and sized with suitable material to render the final product resistant to water and moisture. A fluid mixture of the sized fiber and water is flowed to a depth of 6 to 8 feet in a forming box, drained to a thickness of about 18 to 24 inches, compressed under a pressure of about 400 pounds per sq. in. to a thickness of ¾ in. in a press with platens heated to several hundred degrees F. Ordinarily about 10 to 60 seconds in the press is sufficient.—A.P.-C.

Built-up Roofing and Method of Application. William J. Moeller and Arthur H. Zimmerman assignors to The Philip Carey Manufacturing Co. U. S. pat. 1,805,739, (May 19, 1931).—A built-up roofing of layers of bituminous saturated sheets alternated with layers of bituminous substance is formed upon a roofing support by coating both sides of a saturated sheet with a layer of bituminous material of the desired thickness, forming the coated sheet (after the coating has set) into a roll, unrolling the roll onto the roofing support while applying a solvent to the coated sheets slightly in advance of the line of tangency between the roll and the roofing support, and then unrolling a second roll of the coated sheet material while applying a solvent to the surface of the material slightly in advance of the line of tangency between the roll and the upper surface of the first sheet.

Roofing Shingles and Method of Making Same. Lester Kirschbraun and Otto A. Heppes assignors to The Patent and Licensing Corp. U. S. pat. 1,807,918, (June 2, 1931).—A continuous layer of bituminous coating is applied over the whole width of a sheet of waterproof fibrous material, and grit is embedded in this coating. A second continuous layer of bituminous coating is applied over part of the width of the sheet, so as to leave uncoated edge strips and grit is embedded into the second coating. The sheet is slit longitudinally through the second coating, and is then severed into shingle elements.—A.P.-C.

Toilet Paper. Harrison R. Williams. U. S. pat. 1,806,273 (May 19, 1931).—The lines of perforations of rolls of toilet paper comprise letters constituting an identification of the product, e.g., a brand mark or the name of the manufacturer.—A.P.-C.

Decalcomania Paper. Alfred B. Poschel assignor to Decorative Development, Inc. U. S. pat. 1,811,804, (June 23, 1931).—A decalcomania paper especially adapted for high-speed offset printing presses comprises a paper stock, a water-soluble coating and an overlying coating insoluable in water and having as one of its ingredients a drier capable of drying the ink deposited from high-speed offset printing presses.—A.P.-C.

Impregnating Paper, Pasteboard, Felt, Etc., with Materials such

as Molten Bituminous Material. August W. Andernach. U. S. pat. 1,808,590, (June 2, 1931).—Material such as pasteboard is impregnated in undulated sheet form with a waterproofing agent, and the undulations are subsequently at least partly removed.—A.P.-C.

Apparatus for and Method of Ornamenting Paper. Frank G. Crane and Joseph M. Ward. U. S. pat. 1,804,495, (May 12, 1931).—A number of color troughs are provided transversely above the wire in advance of the suction boxes. Conduits leading from the troughs have their lower ends in alinement, and close to but slightly above the wire, the conduits from the several troughs being arranged in alternating relation. In each conduit is a wick with its lower edge projecting into contact with the web of paper on the wire.—A.P.-C.

Compositions for Coating Paper. Compagnie Centrale des Emeris et Produits à Polir. Brit. pat. 343,970, (Oct. 25, 1928).—Drying oils such as linseed or tung oils are mixed with not more than 25% their weight of asphalt of bitimen (the oil being oxidized by heating the mixture with earths such as ultramarine, Prussian blue, umber or green earth or substances such as salts of lead, manganese or iron, or by bubbling with pure or ozonized air or with oxygen). Various pigments and solvents may be added and the oil may be partially oxidized previous to admixture with the asphalt or the like. The applied coating may be hardened by baking at about 80°C. or by the action of ultra-violet rays or ozonized air, and successive ooatings may be applied and hardened successively.—A.P.-C.

Apparatus for Producing Paper or Variegated Color. P. T. Goldney. Brit. pat. 341,621. (Nov. 16, 1929).—Dye in drops is delivered into the stock as the paper is being made and while it is still wet, at one or more points beyond the slice. Various details of construction of the apparatus are described.—A.P.-C.

Waterproof Paper. R. and W. Watson, Ltd., John H. Watson and Hugh E. Anderson. Fr. pat. 700,662, (Aug. 14, 1930).—A layer of rubber, etc., in sheet form or in solution, is incorporated between two unfinished sheets of paper, and the sheets are pressed together.—A.P.-C.

Manufacture of Impregnated Fiber Conduits. Milton O. Schur assignor to Brown Co. U. S. pat. 1,803,409, (May 5, 1931).—In the manufacture of thick-walled fiber tubes, such as are impregnated with molten pitch and used as conduit for electrical wires, etc., when the pulp is free and contains comparatively little gelatinized cellulose difficulties are encountered in drying; while when the pulp is slow and contains considerable gelatinized cellulose drying troubles are reduced or eliminated but the tubes are difficult to impregnate. There is only a narrow range of hydration or gelatinization of pulp from which tubes can be made. This range is greatly increased by addition to the stock of materials such as ground charcoal or coke, kieselguhr or asbestos flour, ground charcoal, preferably being used.—A.P.-C.

Method of Making Composite Corrugated and Solid Fiber Board. Paul F. Boeye assignor to Waldorf Paper Products Co. U. S. pat. 1,821,539, (Sept. 1, 1931).—In forming a board from a number of sheets, one of the sheets is corrugated. Liquid adhesive is applied between the sheets along longitudinal bands over part of the surface, and along the convex portions of the corrugations over other parts of the corrugated sheet. The sheets are brought together with the adhesive upon the abutting surfaces thereof. While the adhesive is still moist the corrugations containing the longitudinal bands are crushed. The adhesive is allowed to dry to form a board having a corrugated portion and a relatively solid portion extending continuously across the corrugations.—A.P.-C.

Manufacture of Fiber Board of Uniform Thickness. Erwin H. Hussey. U. S. pat. 1,804,560, (May 12, 1931).—In order to ensure uniform thickness of the web across the whole width of the machine in the case of thick board made on a single-cylinder machine, a rotating wire brush, with radial bristles, is mounted parallel to the cylinder mold at a point intermediate between the emergence of the sheet out of the vat and its contact with the couching felt. The distance of the brush from the covering of the cylinder corresponds to the desired thickness. By rotating the brush (which is about 5 in. in diameter) at about 600 r.p.m. in a direction opposite to the travel of the sheet, the excess fibers are removed without disturbing the formation of the sheet. A similar brush, rotating at 600 r.p.m., mounted so as to barely touch the under side of the sheet at a point after it has left the cylinder, removes the wire marks.—A.P.-C.

Method of and Apparatus for Applying a Coating of Adhesive to Paper. Adelmer M. Bates assignor to St. Regis Paper Co. U. S. pat. 1,805,070, (May 12, 1931).—The invention provides an apparatus suitable for applying a strip of adhesive along the edge of each of a number of sheets of paper arranged with their edges in stepped relation. The adhesive is applied by means of a number of disks rotating partly immersed in a tank of adhesive solution. In order to keep a constant level of solution in the tank, an excess is supplied continuously to it, the excess being allowed to overflow back into the supply tank.—A.P.-C.

Breaker Bar for Gummed Paper. Frank Mayo and Frank L. Fraizier. U. S. pat. 1,823,620, (Sept. 15, 1931).—The bar is made with angularly disposed faces across which the material is drawn. At the intersection of the faces a replaceable insert of uniform thickness forms a wear strip for the material.—A.P.-C.

Mechanism for Cutting Shingle Strips. Lester Kirschbraun assignor to The Patent and Licensing Corp. U. S. pat. 1,812,654, (June 30, 1931).—In order to relieve the monotony resulting from the use of shingle strips which are substantially rectangular, the lower edge of the strip is cut by slitting the impregnated web either with a single continuous blade having an undulating cutting edge or a series of blades which produce a slit of broken configuration, the knife or knives being disposed around the circumference of a rotating roll. The shingle strips are cut after the web has been slit, and the diameters of the slitting and transverse-cutting knives are selected so that repetition of the identity of configuration of the exposed edges of the strips occurs only at relatively long intervals.—A.P.-C.

Cutter Head for Shingle Strips. Henry C. Koch. U. S. pat. 1,826,889, (Oct. 13, 1931).—The cutter head consists of a rotating drum mounted adjacent the line of feed of the strip of shingle material and carrying a number of blades arranged with their cutting edges forming a continuous cutting edge around the drum. Means are provided for adjusting the blades radially to compensate for wear during sharpening. The blades have their sides overlapping and are constructed and arranged to maintain their original length and continuous character of the cutting edge when adjusted to take up wear.—A.P.-C.

Process for Making Roofing, Saturated Felts, and the Like. Arthur G. Leonard, Jr. U. S. pat. 1,827,026, (Oct. 13, 1931).—The sheet is saturated directly as it comes from the driers of the paper machine before it can absorb moisture from the atmosphere.—A. P.-C.

Method of Making Sheet Roofing. Isadore Davis. U. S. pat. 1,826,706, (Oct. 13, 1931).—A base sheet is covered by dipping in liquid rubber, then in asphalt and is finally covered with granular material.—A.P.-C.

Process of Decorating Paper. Harry M. Ross assignor to one-half of Beveridge Paper Co. U. S. pat. 1,819,793 (Aug. 18, 1931).—The paper is passed through embossing rolls and then around a roll to which color is applied continuously. The peripheral speed of the coloring roll is different from that of the paper, so that the latter receives a thin application of coloring on the raised portions, leaving the depressed portions free from coloring.—A.P.-C.

Coated or Impregnated Product. Carleton Ellis. U. S. pat. 1,814,135, (July 14, 1931).—A hood cap for bottles is made of

paper composed of two plies of dissimiliar paper stock impregnated with resinated sulphur.—A.P.-C.

Apparatus for Impregnating Strips of Paper. Carl Koops assignor to J. P. Devine Manufacturing Co. U. S. pat. 1,805,145, (May 12, 1931).—The impregnating agent, e.g., asphalt, is contained in a steam jacketed tank which communicates by means of two vertical steam-jacketed conduits with a steam-jacketed vacuum chamber located a suitable distance above the tank. The strip is led below the surface of the asphalt in the tank, upward through one of the conduits, around a roll or sheave in the vacuum chamber, downwards through the other conduit and out of the tank to be rewound. The conduits extend downwards below the surface of the liquid in the main tank so that the liquid rises up in the conduits to a height depending on the degree of vacuum maintained in the upper chamber, which is such that the liquid does not rise into the vacuum chamber itself.—A.P.-C.

Apparatus for Coating and Impregnating Paper. Emil Weinheim. U. S. pat. 1,805,730, (May 19, 1931).—The paper is drawn from a supply roll by means of a pair of feed rolls, one of which is resiliently pressed against the other with constant force. After application, evening and drying of the coating or impregnating material, the sheet passes through a similar pair of rolls driven at the same peripheral speed as the first pair. In order to keep the speed of the paper constant at the supply and delivery end, both the supply and rewound rolls are driven by surface contact with two supporting rolls which run at the same peripheral speed as the feed rolls.—A.P.-C.

Method of Treating Paper. Louis L. Leadbetter. U. S. pat. 1,824,024, (Sept. 22, 1931).—Paper is formed into a continuous web. The entire surface of the paper is oiled, with the exception of the edges. The paper is wound into a roll and the uncoiled edges are trimmed off.—A.P.-C.

Waxed Paper. Anning S. Hammond assignor to Western Waxed Paper Co. U. S. pat. 1,824,885, (Sept. 29, 1931).—A strip of paper is impregnated with wax having a low melting point, and wax having a higher melting point is applied to both sides of the impregnated sheet.—A.P.-C.

Method of Treating Wood Pulp Fibers in the Manufacture of News Print. Judson A. De Cew assignor to Process Engineers, Inc. U. S. pat. 1,816,423, (July 28, 1931).—In order to prevent pitch troubles, alkaline or neutral wax or oil emulsion (containing an amount of emulsified waxy material approximately equal to the amount of pitch contained in the stock) is added to the stock, so as to form a lubricating cover surrounding the resinous globules, which will then pass through the machine wire without sticking to the machinery.—A.P.-C.

Wall Board. Harry C. Raynes assignor to Beamis Industries, Inc. U. S. pat. 1,811,212 (June 23, 1931).—A fiber board is formed of two substantially integral layers, one being of fine fibers having its outer surface calendered so as to be suitable for painting or varnishing without excessive sizing, and the other layer being of comparatively coarse fibers having its outer surface roughened and with open interstices between its fibers, so that it is adapted to receive and retain plaster.—A.P.-C.

Method for Pressing Corrugated Cardboard Flat in Places. Ludwig Clemens assignors to the Firm Wezel & Naumann Aktiengesellschaft. U. S. pat. 1,809,472, (June 9, 1931).—Corrugated cardboard is pressed flat in places by supporting it on the reverse side and pressing it from the upper side to laterally lay over the corrugations on the upper side, converting them into shallow ribs corresponding in height to the thickness of the paper and to displace these ribs during the pressing operation towards the yielding reverse side of the cardboard, thus producing a completely flat upper surface.—A.P.-C.

Stencil Sheet. Charles F. Kumli assignor to Selectograph Co. U. S. pats. 1,810,483 and 1,810,484, (June 16, 1931).—No. 1,810,483.—A porous base such as Japanese yoshino paper is coated with a mixture of an organic colloid such as glue, a tempering agent such as glycerine, and a water-soluble permanganate such as potassium permanganate, which serves to coagulate the glue. No. 1,810,484 describes the use of a coating comprising a colloid such as glue, a tempering agent such as glycerine and Schweitzer's reagent, which serves to render the material waterproof.—A.P.-C.

Gauging the Thickness of Paper Coating. Ernest L. Kallander assignor to Dennison Manufacturing Co. U. S. pat. 1,815,915, (July 28, 1931.)—In order to apply a uniform thickness of coating on paper, a current of electricity is passed through the coating and paper at a point where the coating material is set and through a current-resistance indicating device. The amount of coating applied to the paper is controlled so as to keep the reading of the indicating device substantially constant.—A.P.-C.

Coated Paper in the Printing Industry. J. B. Meyer. Paper Maker and British Paper Trade J. 82, No. 2: xlvi-xlviii (Aug. 1, 1931).—A brief outline of the properties of the chief kinds of coated papers and of their uses.—A.P.-C.

Pulp and Paper Testing

More About the Determination of Lignin in Cellulose. A. Noll. Wochbl. Papierfabr. 62, No. 20: 474-476 (May 16, 1931); Zellstoff Papier 11, No. 7: 409-411 (July, 1931). The author recommends a new quick method, which has no objectionable features and probably isolates the lignin in the form in which it is present in the pulp. Three grams of bleached pulp (one gram of unbleached), rasped and dried at 100° is moistened with 5 c. c. of dimethyl analine, and to this is added 25 c. c. of a 78 per cent solution of sulphuric acid and the entire mixture stirred. If the dextrine test is negative, 200 c. c. of hot water is added and the mixture is then cooked for ten minutes, then filtered and washed free from acid, dried and quickly weighed.—J. F. O.

Tensile Strength or Tearing Length of Pulp. E. Richter. Tech. Chemie Papier Zellstoff Fabr. 28, No. 2: 17-20 (April 11, 1931).—The author investigated the various relations between the different pulp factors such as freeness, tear, tensile strength, fold and copper number, and from these factors the quality of the pulp and its special use is determined. There is a close relation between the tensile strength and the bursting strength, and these tests are effected completely opposite to the fold, stretch and tear.

Relation of Sheet Properties and Fiber Properties in Paper. II. The Variation of Ultimate Strength with Basis Weight and Related Factors. R. H. Doughty. Paper Trade J. 93, No. 15: 44-49, 54 (Oct. 8, 1931).—From a study of the variation in ultimate tensile strength of test sheets, made from unprocessed spruce sulphite pulp, at various solid fractions and basis weights, the following conclusions were drawn, that may be tentatively applied to paper sheets in general: (1) Sheets of constant basis weight show a mathematically regular increase in tensile strength with increase in solid fraction; the increase in solid fraction is obtained by increase in wet pressure. (2) Sheets of the same solid-fraction values show a regular decrease in tensile strength with increase in basis weight when the volume of stock used in their formation is kept constant and consequently the consistence is varied in proportion to the basis weight; this strength decrease is primarily a result of the consistence change rather than of the weight change. (3) Sheets made up under constant wet pressure show a continuous increase in solid fraction with increase in basis weight, as a consequence of greater shrinkage on drying. (4) As a consequence of the two last effects, sheets made up under constant wet pressure and with a constant volume (variable consistence) of stock first increase and then decrease in tensile strength when basis weight is increased from a low value. (5) The relations involved may be expressed as $S = kC^nF^m$, in which S is the ultimate tensile strength, C the consistence of the pulp, F the solid fraction of the sheet, k is a character-

istic of the pulp that is designated "fiber strength at unit consistence," and m and n may or may not be characteristics. (6) Sheets of low basis weight, *e.g.*, 21.5 lbs., show an anomalous behavior that may be either specific or an effect of inaccuracy in thickness measurements. (7) The various effects of basis weight just noted appear to be explainable from the standpoint of the fiber arrangement, particularly the concept of orientation of fibers perpendicular to the surface of the sheet.—A. P.-C.

Notes on the Determination of the Tensile Strength of Paper. Raymond Fournier. Papeterie 53: 1066-1077 (Sept. 10, 1931).—When cutting out a test strip for the determination of tensile strength, the edges of the strip are mutilated, and therefore weakened. The results of the test are therefore too low and represent the actual strength of the unmutilated paper less the decrease resulting from the mutilation along each edge of the strip. As the latter is independent of the width of the strip, the results obtained with wide strips are proportionately higher than with narrow strips, up to a certain width above which the results are practically proportional to the width. As the construction of instruments with wide jaws offers certain difficulties, the author proposes that the instruments at present in use be retained, but that the strips be at least twice, and preferably 3 to 4 times, as wide as the jaws (15 mm.). The test would be simplified (less care required in preparing the strips), the results would be higher and would more truly evaluate the quality of the paper under the conditions of use.—A. P.-C.

Porosity and Density Measurements of Paper Mathematically Related. R. A. Krauss. Pulp Paper Mag. Can. 30: 1054 (Sept. 17, 1931).—Theoretically, the results obtained with the Schopper porosity tester (S) and the Gurley densometer (G) are related by the expression $G = 6992/S$; but it was found experimentally that the relation is $G = 7300/S$.—A. P.-C.

Carter Paper Stiffness Tester. E. C. Carter. Paper Trade J. 93, No. 15: 54 (Oct. 8, 1931).—A test strip 1.5 in. wide and 3 in. long is held at one end in a clamp and the other end is connected by means of a wire hook to a pendulum. The arm on which the clamp is mounted swings on the same center as the pendulum. As the clamp is raised the specimen lifts the pendulum and gradually flexes as the load increases. When the end of the specimen lines up with the index on the end of the clamp arm (indicating that the paper has been bent through an angle of 90°), the scale reading indicated by a pointer attached to the pendulum is taken. If wider or narrower specimens are used for testing, the reading is proportional to the width.—A. P.-C.

Schopper-Dalen Bursting Tester. An Attachment for Ensuring a Constant Rate of Load Application. Cyril V. Oliver. Paper Maker & Brit. Paper Trade J. 82, No. 2: xxxviii-xxxix, xlviii (Aug. 1, 1931).—In the latest type of Schopper-Dalen bursting tester a graduated quadrant, fixed to the stem of the control and designed so that a pointer fixed to the hand wheel of the valve runs over the graduations on the quadrant, permits of opening the valve to any pre-determined aperture for any given test. In order to ensure that the valve shall only be opened to this aperture, a number of holes are drilled in the quadrant, corresponding with various openings of the valve; a removable brass peg is inserted in the required hole to prevent the valve from being inadvertently opened wider than desired.—A. P.-C.

Methods and Instruments for Opacity Measurement. M. N. Davis. Paper Trade J. 93, No. 16: 39-42 (Oct. 15, 1931).—The various types of instruments at present in use for measuring the opacity of paper are briefly discussed, pointing out the fundamental inaccuracies which must exist when so many different quantities are used as measures of a single paper quality. It is suggested that the "printing opacity" (defined as the ratio of the intensity of the light reflected from a single sheet of paper backed by an ink spot, or other body which reflects no light, to that reflected by a thick pile of the paper) affords an exact measure of the opacity desired in printing papers. One instrument, making use of a photoelectric photometer, suitable for measuring this property is described. Any instrument, however, designed to determine "contrast ratio" (defined as the ratio of the intensity of light reflected from a single sheet backed by a black body to the intensity of light reflected by a single sheet backed by a standard white reflector which reflects all but 2% or 3% of the light falling on it) may be adapted to the measurement of "printing opacity." It is concluded that while "printing opacity" seems to be the best measure of the opacity of printing papers, the coefficients at present in use are sufficiently accurate for the comparison of similar samples and will lead to large errors only when the opacities studied are very low or when color differences exist.—A. P.-C.

Optical Apparatus for Determining the Finish of Paper. Charles H. Milligan assignor to The Champion Coated Paper Co. U. S. pat. 1,810,433 (June 16, 1931).—The principle of the apparatus consists in directing a beam of light upon the sample of paper at a low angle of incidence, less than 20° and preferably 8 to 10°, to produce an image on the paper approximately 3/8 in. in the longitudinal dimension, and measuring the intensity of the light that is specularly reflected from the paper. The reflected light is observed through an eye-piece side by side with the light coming directly from the luminous source after passing through an optical wedge comprising two plates of glass with a gelatin film between them. The gelatin film is transparent at one end and regularly increases in opacity to the other end. The optical wedge carries a graduated scale, and by means of a pointer mounted on the casing of the instrument the position of the wedge is indicated on the graduated scale.—A. P.-C.

Results in the Determination of the Wool Content of Raw Board by Chemical Means. R. Korn and B. Schulze. Zellstoff Papier 11, No. 4: 206-207 (April, 1931).—Results of the test adapted by this laboratory to determine the amount of wool in certain boards, made by several manufacturers. The residue after treatment with 80 per cent sulphuric acid is calculated as the wool content. The method is given in detail along with much comment on the various boards.—J. F. O.

Paper Testing in America. Zellstoff Papier 11, No. 5: 263 (May, 1931).—Review of recent problems of the Bureau of Standards, such as, influence of surface sizing on the strength of the paper, influence of the acidity on the durability of papers, etc.—J. F. O.

Testing of the Elasticity of Cigarette Paper. Zellstoff Papier 11, No. 6: 354 (June, 1931).—Description and operation of a tester to determine the elasticity of cigarette paper, invented by K. Mandl. The elasticity of the paper is greater in the machine direction than across. The elasticity increases with the thickness of the paper.—J. F. O.

Can the Knowledge of the Bursting Pressure of a Test Surface Be Used in Calculating the Bursting Pressure of Another Surface of Different Area. G. Bierett and Bruno Schulze. Papier-Fabr. 29, No. 15: 231-235 (April 12, 1931).—The following equation has been worked out to convert the bursting pressure of a known area to the bursting pressure of a different area.

$$\frac{pm}{pn} = \frac{x}{\sqrt{fm}}$$

For the paper under investigation the value of "x" was between 1.6 to 1.8. This equation is not applicable in paper with a very low bursting strength, that is, bursting strength under 0.6 kilograms per square centimeter for a surface 10 square centimeters, for experimental errors are then too great. "f" is area and "p" is the bursting strength.—J. F. O.

POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

Conducted by Reginald Trautschold Consulting Engineer

Thermal Insulation Pays Well*

Heat Leakage Means Serious Money Loss

Heat leakage, as every mill knows to its cost, is one of the most insiduous and serious of burdens imposed in the manufacture of pulp and paper, though it is very questionable whether any mill has a true conception of the magnitude of the money loss entailed. Few realize, for instance, that 1,000 square feet of exposed boiler surface or of steam lines handling 100 pound steam will cause a waste in fuel equivalent to more than 300 tons of coal annually and many more will be surprised to learn that a single pair of bare 10-inch flanges in a high pressure steam line may cost as much per year as a ton of coal.

In one mid-western plant, where a 100-horsepower, marine type, boiler is employed, the insulation of the exposed boiler surface, a few hundred square feet, with a 1½ inch coating of rock wool (argillaceous limestone) and a covering jacket of insulating cement saves at least 600 pounds of coal a day, upward of 90 tons per year. This example, moreover, is not an exceptional case, but rather a practical exposition of the success with which the aforementioned measures of heat wastage can be reduced by suitable thermal insulation.

Furthermore, neither the example nor these empirical units of heat leakage expose the full situation, so far as the real question of thermal insulation in pulp and paper mills is concerned, for while they are doubtless impressive they have to do simply with heat leakage in the power plant, with heat wastes that can be reduced 90 per cent by suitable insulation of steam carrying equipment. This particular phase of the insulation question has already been covered fairly well in these columns, so that the present discussion can very properly be confined chiefly to a consideration of heat leakages in the mill proper and between the power plant and the mill, featuring approved means and methods of combating such wastage of heat.

The differentiation between heat leakage in the power plant and the thermal losses occuring in the mill building is a very proper one, incidentally, for the problems entailed in thermal insulation in power plant and mill are for the most part quite dissimilar. In the power plant, relatively high temperatures have to be contended with, while in the mill the temperatures quite generally considerably lower. Insulating materials essential for high pressure power plant service are not necessarily economical or effective in reducing heat losses in the mill and insulation of great value in mill services may be next to worthless for certain power plant service applications where high steam temperatures and pressures pertain.

This distinction between the power plant and mill insulation requirements is especially pertinent in the paper making field, because insulating materials used with considerable success on the low pressure steam mains of some of the older mills are very far from being suitable for like applications in the newer mills served by modern high pressure steam plants. Conditions have changed to such extent that the general characteristics of insulating materials, at least, should be familiar to the operating engineers of the mills, particularly of those mills that have not recently inspected and tested their installations of heat insulating materials. There are a number of definite requirements that an insulation for any specific application should meet for the insulation to be considered satisfactory.

Classification of Insulating Materials

The raw, basic materials used in present-day insulation service fall naturally into two main classes, organic and inorganic, both of which are required for the satisfactory insulation of the modern mill and steam plant, but each in its proper place. The insulations of animal or vegetable origin, although used almost exclusively in the old days for power plant as well as for mill applications, are not really suitable for use in applications where temperatures of much above 250 degrees Fahrenheit are encountered. This, because the decomposition of the organic materials begins at about this temperature, weakening the mechanical structure of the insulation and introducing, under some circumstances, a dangerous fire hazard.

These organic, non-heat-conducting, coverings, consisting for the most part of cork, hair, rags or matted vegetable fibers, are admirably suited, however, for atmospheric insulation services where ordinary and moderate temperatures pertain, *i. e.*, temperatures for the most part below that of steam at atmospheric pressure, and are used extensively in what may be termed general building, or mill, insulation. The most generally employed of these materials is cork, the cellular structure of which is a characteristic that gives it marked heat retardant properties, even in its natural state, properties that are intensified by the processes entailed in the manufacture of commercial corkboard and cork pipe covering.

The low thermal conductivity of cork is due to the fact that it is a mass of tiny sealed cells, microscopic in size, each cell containing an almost infinitesimal particle of air, so small that it cannot circulate and so tightly imprisoned

* For previous discussion on heat insulation see PAPER TRADE JOURNAL, July 10, 1930.

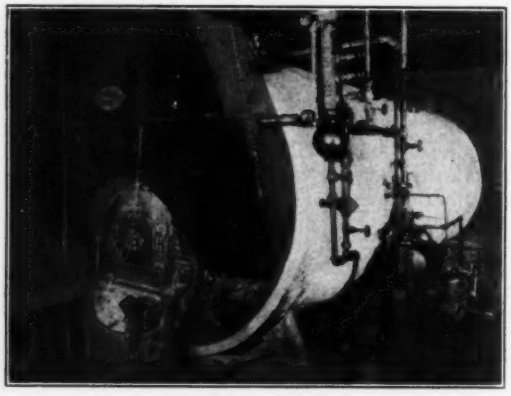
that it has no immediate contact with the air particles in neighboring cells. In its manufactured form of corkboard, it is permanently moisture proof and is not liable to deterioration through decay, mold or other structural change.

In the process of manufacturing corkboard and cork pipe covering, cork granules are pressed into metal molds and baked at a moderate temperature. The baking liberates the resin in the cork, the gums flowing through the entire mass and serving, after the covering is cooled, to cement the granules together and to waterproof each individual granule. When the sections come out of the molds, they may be further protected against air and moisture penetration by a thin coat of mineral rubber or of some suitable waterproof cement.

The insulating value of hair, usually felted cattle hair, is also excellent, but while the material is well suited for certain pulp and paper mill insulation requirements, its use by the paper making industry has been quite limited, and is likely to remain so. Wool felt covering is occasionally used for the insulation of hot water lines, but even in such service it is advisable to provide an inner liner of asbestos paper to protect the wool against the decomposing effects of heat.

Some of the insulating materials made of matted or felted fibers, of sugar cane, flax, corn stalk, rice plant and other similar fibrous plants, also have good insulating value, so long as they are kept dry. Unfortunately, all such materials are to a greater or less extent absorbent and will soak in moisture, on account of their capillarity, a property inherent to all fibrous structures. No method of permanently moisture-proofing these fibrous materials has yet been developed, at least none that will withstand severe service, so on this one count the fibrous materials rank below organic materials of cellular structure, such as cork, in insulating effectiveness.

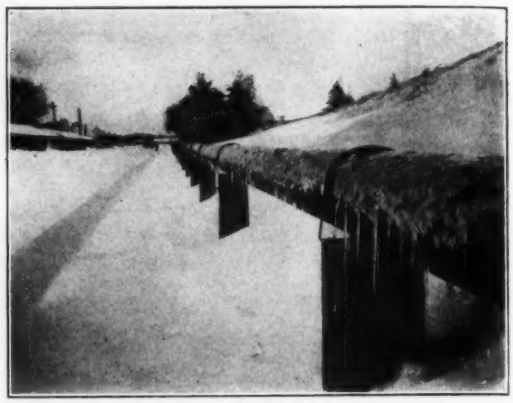
The insulating factor in all organic insulators is "still" or "dead" air, air that does not circulate and transmit heat by convection. Air, in any appreciable volume, does tend to circulate, however, and it can only be prevented from doing so by being broken up into particles so small that there can be no circulation in the particles and so well sealed off from one another that there is no communication through which circulation can take place between the particles. These exacting requirements are met only by the exceedingly fine cellular structure that is characteristic of high grade cork, for all insulating materials made of matted or felted fibers contain a certain amount of air entangled among the fibers and while this air is considerably broken up, the air particles are not actually isolated and circulation between them does take place to a limited extent.



Courtesy: General Insulating & Mfg. Co.

FIG. 1

Covering jacket of insulating cement saves at least 90 tons of coal per year.



Courtesy: Keasbey & Mattison Co.

FIG. 2

Pipe line of Bird & Sons, Inc., on a typical winter day.

INSULATING VALUE OF ORGANIC MATERIALS

Material	Weight lb. per cu. ft.	Thermal Conductivity Btu. per hr. per sq. ft. per in. thick, per deg. Fah.
Corkboard	9.75	0.29 to 0.32
Hair felt	16.88	0.247
Wool felt	20.60	0.36 to 0.43
Various matted vegetable fibers....	11.25 to 16.45	0.30 to 0.33

The Philip Carey Company

Inorganic Insulating Materials

When it comes to the permanent insulation of hot surfaces, having temperatures of above 250 degrees Fahrenheit, it is usually more economical and in the majority of cases actually essential to employ inorganic, heat resistant materials, substances that are not subject to ignition and to charring when exposed to continuous heat. The basic materials entering into the construction of these present-day inorganic heat insulations are: asbestos fiber, magnesia, diatomite, clays, soda ash and sand. Some of these materials that are depended upon to supply the essential insulating property lack adequate cohesiveness, however, necessitating the introduction of a bonding material to supply the required strength for a satisfactory insulator. Asbestos fiber in one or another of its several forms, an excellent and natural insulator in itself, is almost universally used for this purpose.

Asbestos is a fibrous mineral of crystalline formation and contains, therefore, a certain amount of combined water of crystallization. Various varieties of asbestos contain different proportions of this combined water, the Canadian variety from 10 to 15 per cent, while the African variety contains only from 4 to 10 per cent. The higher the content of combined water, the better is the physical strength and flexibility of the fiber and it is an established fact that as the asbestos fiber loses its water of crystallization it simultaneously loses its physical strength. This is highly important, for it sharply limits the effectiveness of asbestos fiber as a bonding material in high temperature insulation.

The Canadian variety of asbestos, with its high content of combined water, commences to lose water of crystallization and its strength as well at approximately 842 degrees Fahrenheit and at 1,472 degrees breaks down into a powder. The African fiber starts giving off its water of crystallization at about 572 degrees and at 1,112 degrees it is completely gone. Consequently, satisfactory physical strength in insulating materials cannot be secured with

the use of asbestos alone at temperatures much above 1,100 or 1,200 degrees Fahrenheit. Where such temperatures are exceeded, the incorporation of some other bonding material, one resistant to high temperatures, is necessary, even though the addition of such bonding material may detract from the natural insulating qualities of the other ingredients. It then becomes necessary to set as advantageous a balance as possible between the mechanical strength requirements of the insulation and the insulating effectiveness of the product.

Some diatomaceous earths, consisting of microscopic skeletons of small sea animals, possess good insulating qualities and various clays are sometimes used as adhesive bonding materials, despite the fact that they may seriously reduce the insulating efficiency of the insulation. The chief objection to the use of clays as an added bonding ingredient in insulations is, however, that they are quickly softened and reduced to a plastic condition by water, a serious drawback if the insulation is liable to be exposed to moisture, either from the elements or from leaks in the piping.

Silicate of soda, a manufactured product from soda ash and sand, commonly called water glass, is frequently used as an adhesive in the manufacture of asbestos insulating materials. It is a high heat-proof material that will withstand temperatures of from 1,300 to 1,400 degrees before it commences to decompose.

These insulations for extremely high temperature services are not of particular interest to mill engineers, that is to say outside of their place in the modern high pressure power plant, but there are a few other varieties of inorganic insulations which are becoming used more and more in the mills proper and outside of the confines of the steam plant. One of these is carbonate of magnesia, a manufactured product obtained from dolomite rock, a mixture of carbonate or magnesia and carbonate of lime. Manufactured carbonate of magnesia mixed with asbestos and water and molded into shapes is the familiar commercial 85 per cent magnesia insulation used so extensively.

Carbonate of magnesia, itself, is of white crystalline structure, possessing high cohesive properties up to a temperature of 500 degrees. At this critical temperature, however, the carbonate commences to give off its water of combination and liberate carbon dioxide gas, a disintegration termed calcination that changes the carbonate of magnesia into the oxide of magnesia. The insulating properties of the calcined material are on par with those of the carbonate, but the natural cohesiveness between the crystals of the mineral is destroyed. The chemical change, consequently, limits the permanent and satisfactory working temperature of commercial 85 per cent magnesia to between 550 and 600 degrees, but within this range 85 per cent magnesia is probably the best insulating material of the molded type for use on steam lines.

Courtesy: Johns-Manville Corp.

FIG. 3

Well covered mill piping at the Neenah, Wis. mill of the Bergstrom Paper Co.

Courtesy: Armstrong Cork & Insulating Co.

FIG. 4

Laying 6,000 sq. ft. of 2-in. corkboard roof insulation over wet and finishing sections of machine room, Richardson Paper Co., Lockland, Ohio.

Efficacy of Proper Pipe Insulation

The efficacy of suitable pipe insulation of this variety is demonstrated in no more conclusive manner than in an installation made back in May, 1925, one that still ranks as an outstanding achievement in economical steam distribution, about a mile of exposed piping carrying steam from the East Walpole plant of Bird & Son, Inc., to the company's Norwood plant. Actually, this line delivers the steam equivalent of 10,000 kilowatts at 163 pound pressure through some 4,500 feet of pipe, skirting the railroad right of way, passing over tracks and public streets, in the open every foot of the way, with a heat loss of only 3 per cent.

The reason for making this very unusual installation was that while steam could be generated at the East Walpole plant at attractive and satisfactory cost, the unit cost of generating steam at the considerably smaller Norwood plant, as was formerly done, was just about twice as much and it was felt that all the steam could be generated at the larger East Walpole plant and the Norwood steam requirements piped to the smaller plant at an actual saving. As a considerable investment was tied up in the Norwood boiler room, which would necessarily be shut down, the burden of carrying charges, amounting to approximately 20 cents per 1,000 pounds of steam demand at Norwood had, in determining the feasibility of the venture, to be charged against the cost of the proposed 8-inch pipe line. In spite of this heavy sur-charge, it was felt that the plan of generating all the steam at the East Walpole plant and piping the steam requirements of the Norwood plant would effect sufficient saving to justify the venture and the installation was made. Since then, not only has the plan proved well justified, but an actual net saving of approximately 15 cents per 1,000 pounds of steam demand has been realized.

The actual length of the pipe line is 4,550 feet, but including the pipe length for resistance offered by bends, valves and fittings, the equivalent length of the line is a matter of 4,839 feet of 8-inch steel pipe, 0.322-inch thickness, protected from heat loss by only two layers of molded, sectional, 85 per cent magnesia pipe covering,

with joints staggered in alternate layers, and an outer wrapping of hair felt and two thickness of roofing paper. In winter, as shown in the accompanying view, the pipe line is covered with snow and ice, yet the heat loss is almost negligible in even the most severe weather.

An 8-hour test conducted with the average outdoor temperature at 25 degrees Fahrenheit, starting at 8:30 a. m. and ending at 4:30 p. m., showed that with steam at the pipe line inlet under a pressure of 163 pounds per square inch, 99.154 per cent dry, the steam delivered at the other end of the long pipe was under a pressure of 133 pounds, 96.52 per cent dry. The heat loss in the latent heat of steam condensed together with the heat carried away by the condensation totaled on the average to 987,124 Btu. per hour, while the total heat received at the Norwood end of the pipe line amounted on the average to 35,733,119 Btu. per hour, the heat input at East Walpole averaging 36,720,243 Btu. per hour. In other words, the line loss amounted to only 2.688 per cent.

A 50 and 40 Per Cent Saving

Another interesting installation of a long exposed pipe line, demonstrating the value of modern pipe coverings, is the 8-inch line between Mill No. 4 and Mill No. 1 at the Fitchburg Paper Company establishment, Fitchburg, Mass., a line over 1,000 feet in length and protected against heat loss by the same variety and weight of pipe covering used for the outdoor steam line of Bird & Son, Inc., *i.e.*, two layers of 85 per cent magnesia and an outer 1-inch wrapping of hair felt with two thicknesses of roofing paper, a total insulation thickness of slightly more than 4 inches. This installation has a two-fold history, both of which are decidedly noteworthy.

The line was installed in 1927 for the purpose of supplying Mill No. 1 with steam at 150 pound pressure from the power plant of Mill No. 4, the power plant of the former mill having been shut down. The steam was used in two engines driving generators for supplying current for the operation of Mill No. 1 and the exhaust from these engines furnished the process steam for the mill at a pressure of 12 pounds per square inch. This initial stage of the development was eminently satisfactory, no difficulties of any kind being experienced, so effectively did the piping insulation function, and the yearly saving in labor and fuel, effected by the abandonment of the boiler room at Mill No. 1, was never less than 50 per cent of the investment entailed by the plan per annum.

The second stage, or step, in the development came about more recently, it having been determined that the 17,000 pounds or so of steam at 12 pound pressure required per hour by Mill No. 1 for process operations could be brought from Mill No. 4, via an 8-inch insulated pipe line, provided the steam entered the pipe line at Mill No. 4 at a pressure of 25 pounds per square inch. Such a steam supply would make the operation of the two engines at Mill No. 1 unnecessary, the exhaust from such units being no longer required for process steam and the current required by Mill No. 1 more economically generated by a modern steam turbine located at Mill No. 4 near the steam supply.

An efficient steam turbine-generator set, operating against a back pressure of 25 pounds, was installed at Mill No. 4, consequently, the exhaust from which was carried to Mill No. 1, via the pipe line installed originally to supply the engines at Mill No. 1 with high pressure steam, while the current output was used not only for Mill No. 1 process requirements, but in large amount for Mill No. 4 as well. This current cost, incidentally, much less than Mill No. 4 had been paying for public service current. The only change required in the steam line to make the new setup highly efficiently effective was the insertion, rather substitution, of a section of 10-inch pipe at the Mill No. 1 end of the steam line. The net saving effected by this remodelling of the steam and current distributions has netted a 40 per cent return annually upon the entire entailed investment.

Mill Insulation

Such very decided savings as have resulted from effective insulation of exposed lines of steam piping, run in the open, really makes it unnecessary to discuss the value of properly protecting the piping within the confines of the mill, where conditions and situations are far less severe. Insulating materials of suitable character, modern pipe coverings suitable for satisfactory insulating service under virtually all thermal conditions, are now generally familiar and are readily obtainable. Neither is much to be gained by the citation of readily procured evidence regarding substantial savings effected by the proper heat insulation of pulp and paper mill equipment in general. This, also, is a phase of the general problem of mill insulation concerning which knowledge is quite general. There is, however, another phase of the insulation question that can well be taken up, that of general mill insulation, or, more specifically, the insulation of paper mill roofs.

In this connection, a report prepared by a prominent manufacturer of corkboard and other forms of insulation will prove of quite widespread interest. It discusses the insulation of paper mill roofs against heat losses by means of modern, quality, corkboard, an insulation well suited, by virtue of the distinctive cellular structure of cork and the moisture-proof qualities of the manufactured corkboard, for just such service. This report, in somewhat condensed form, follows.

Insulation of Paper Mill Roofs[1]

In recent years, architects, engineers and building owners, especially in the paper industry, have come to realize that the roof really has a double purpose; to shut out the snow and rain and to temper the winter's cold and the summer's heat. In other words, in addition to being weathertight, the roof should be, as near as possible, heattight. Then, too, there is the consideration of eliminating condensation of moisture on ceilings or the underside of roofs where a high relative humidity is maintained, as is found in different rooms in paper mills, especially in the machine room.

This condensation, or sweating, results from the contact of humid air with a cold surface and in order to prevent it, it is necessary either to reduce the humidity of the air by some means or to reduce the thermal conductivity of the roof and walls, so that they will not become cool to the point where condensation can take place. The latter is the more practical method, since it does not disturb the humid conditions essential to the manufacturing processes. It is much simpler and more effective to prevent the chilling of the building surfaces, particularly the roofs, by insulating them to stop the sweating annoyance.

The capacity of air to absorb and hold moisture in suspension varies with its temperature, warm air holding more moisture than cold air. This fact, if kept in mind, will make clear what happens in a specific case under certain temperature conditions. Take, for example, a mill in a northern state with a 4-inch concrete roof slab covered with some standard uninsulated roofing. A temperature of 85 degrees with a relative humidity of 75 per cent may be assumed, with an outside temperature of zero.

[1] Digest of report by the Armstrong Cork & Insulation Co.

It is at once obvious that with a temperature difference of 85 degrees, that the roof slab is rapidly cooled by loss of heat from its warmer to its colder side and that in consequence the temperature of the air in contact with the underside of the roof is lowered.

The temperature at which condensation of the hot moist air assumed for the mill is reached when a drop of only 5 degrees occurs. In other words, when the temperature of the underside of the roof drops to 80 degrees, roof condensation takes place, the effects of which during the colder months of the year are:

1. The dripping of water from the roof discolors and injures the quality of the paper in process of manufacture, rusts and otherwise damages machinery and equipment and creates an extremely unpleasant condition for employees and one detrimental to the production process.
2. In the case of a wood roof, the moisture soaks the timber and promotes decay. When ceilings are plastered, the continued soaking will in time cause the plaster to disintegrate and fall. In the case of concrete and gypsum roofs, the warm humid atmosphere tends to promote crumbling and spalling.
3. Moisture absorbed by any wood roof structure increases its thermal conductivity and rapidly lessens its heat resistance.

These conditions are neither special nor temporary. On the contrary, they exist in practically every paper mill where the roof is inadequately insulated. They persist as long as cold weather lasts, which in the northern states means for most of the winter months.

That such conditions are not merely academical and theoretical, but are widespread, is evident by examining briefly such a typical instance as the experience of the New Haven Pulp and Board Company. The paper mill had a 4-inch roof in the machine room and annually was faced with a serious menace due to condensation during the fall and winter months, when inside temperatures dropped to 55 or 60 degrees with relative humidities of from 30 to 100 per cent. A hot air blower system was required to hold the temperature under the roof above the dew point and the dry end of the machine had to be fitted with a felt canopy in order to protect the paper against spoilage. In spite of these precautions, the roof condensation rotted out the roof so seriously that it had to be replaced after only nine years of service.

For replacement, a cork insulated tile roof was selected, the extra cost of the adequately insulated roof being considered a good investment if it overcame the roof condensation trouble. The results with the new roof are, not only the avoidance of paper spoilage by dripping condensate, but the elimination of any need for a canopy over the dry end of the machine. Improvements over the wet end of the machine were also realized and as all roof condensation has been overcome the life of the new roof is expected to be much longer than was that of the inadequately insulated roof.

Saving in Coal Consumption

In addition to these very material benefits effected by eliminating roof condensation by means of proper roof insulation, there has been a considerable reduction effected in the amount of coal consumed. Unfortunately, there are no statistics available to show how great has been this saving, but that it has amounted to a goodly amount is very evident from computations based upon conditions at another mill located in New England.

The inside temperature in this case may be taken as 85 degrees and the minimum outside temperature around 15 degrees below zero, with an average heating season temperature of 35 degrees. The mill had 14,000 square feet of roof deck of 4 inch concrete covered with standard roofing. The total heat transmission through the uninsulated roof, during the heating season of 210 days, averages 397,600 Btu. per hour, or for the whole heating season a total of more than 2,000,000,000 Btu. By insulating the roof with 1½ inch corkboard, the average heat transmission wastage per hour during the winter is reduced to 103,000 Btu., or for the entire heating season to somewhat less than 430,000,000 Btu. The difference between the totals represent a saving of something like 88 tons of high quality coal, assuming the efficiency of the heating system to be 60 per cent, realized entirely from insulating the roof.

In still another instance where a mill roof previously uninsulated was effectively insulated with corkboard, a careful survey shows a gross saving in steam cost per year of $631.80. In this case, deductions for all fixed charges, depreciation figured on a 30 year life and a generous allowance for repairs, an allowance incidentally that was not drawn upon for the first three years, brought the net annual saving down to $223.75, in itself a goodly sum, since it is net.

Ordinary Experiences

These experiences, one and all, are far from being unusual, simply a few ordinary cases that have come under observation. If the economies shown to be generally obtainable through proper paper mill roof insulation are fairly appraised and added to those savings known to result from the proper insulation of boilers, stack breechings, stacks, other power plant and mill equipment, including the very material savings made when all piping is properly covered, it will be found that complete thermal insulation affords quite unusual promise of greatly reducing mill production and operating costs. In fact, there are very few, if any, pulp and paper mills that cannot undertake to very decided advantage a careful inspection and test of their various causes of heat losses, with the view of capitalizing upon better or more insulation insurance.

Use of Optical Instruments

The Bausch & Lomb Optical Company announces the successful completion of its first two weeks course for chemists in the use of optical instruments. Registration was by invitation and was limited to 15 men, representing 15 nationally known companies maintaining research and control laboratories.

The course as given, presented theory and principles; laboratory work in the use of instruments; and two and one-half days of special work for problems and samples brought by the registrants. Some of the individual topics were Colorimetry, Spectrophotometry, Spectrography, Refractometry, Microscopy, Photomicrography and Chemical Microscopy.

The staff of instructors was entirely made up of members of the Bausch & Lomb Scientific Bureau, with the exception of Dr. Chamot, of Cornell, who as guest instructor, took care of the work with the chemical microscope.

The purpose of the course was to familiarize the registrants with the possibilities of instrumental methods, and to demonstrate some of the more recent developments such as the Littrow Quartz Spectrograph.

Of especial interest to paper men is the attendance of Dr. B. W. Rowland of the Institute of Paper Chemistry and H. N. Lee of the Hammermill Paper Company.

The course was so completely successful and satisfactory to everyone, that it will no doubt be repeated next year.

The Balance Fourdrinier Shake

To overcome the trend of the fibers to float with the traveling currents of the stock water, the custom has been to agitate or shake the Fourdrinier part at the breast roll of the machine, so that the stock waters as they flow from the apron to the traveling wire will be disturbed disarranging the floating fibers and causing them to interlace. Inasmuch as the shaking of the part is secured from the side of the machine, the effect of these agitations gives a different surface to the top of the sheet than the bottom of the sheet has; as the wire side of the sheet will show a very large portion of the fibers laying in formation lengthwise of the sheet, while the top of the sheet will show the fibers interlaced resting at different angles. The reason for this is, as the stock water leaves the apron the top is in perfect agitation due to the shake while the bed resting on the apron is relatively at rest floating or flowing steadily onto the traveling wire carrying the fibers along in the manner that it is natural for them to float. The moment the stock water reaches the traveling wire gravity acts and is further assisted by the capillary action of the turning table rolls, this causes the water immediately to leave the fibers and bring them to the surface of the wire as they are floating in the current, while the agitating effect is still acting and as the water rapidly leaves you secure a different effect or formation on each side of the web of paper formed, the formation so secured is not in a general sense harmful or injurious, but for high grade work in the printing art has met with critical statements.

Many Experiments

The desire to overcome the different character of the surfaces has led to many experiments, not only in the construction and locations of the shaking devices but to the use of disturbers and rectifiers located in the head boxes and at the slices, all of which have given varied results. These experiments have proven that to secure an even sided sheet, the stock waters carrying the suspended fibers should be given not only the sidewise agitation as is the present custom, but a rolling motion as well, so that the fiber's flow will be disarranged at the bed of the flow as well as the open side, which can be secured by balancing the shake. The result will be a uniform interlacing of the fibers throughout, with surfaces balance as to the lay of the different fibers when they come to rest.

Where a shake is employed, as you watch the stock water flow as it leaves the slices and is no further held by the apron, you will notice ripples along the line of travel continuing until the excess water has left the forming sheets of paper. These ripples are formed by the jerky motion produced by the shake and with no medium for breaking the mat of fibers that have formed on the wire.

Shaking of First Importance

In the art of paper making the shaking of the Fourdrinier wire is of first importance as it must be given with rapidity and an easy uniform motion. As the shake rod is attached to the shake post on the drive side of the machine it gives no matter how careful consideration has been given to construction, two jerks or breaks to each revolution of the shake drive pulley, and these motions are transferred to the stock water, and act much more rapidly to the open side of the stock water than to the wire side, hence a very different interlacing of the fibers.

To overcome this difference of the interlacing of the fibers the balancing of the shaking device has been developed and has largely overcome the differences of the surfaces of the sheet and brought them to a nearly uniform texture as to the laying of the fibers; and this together with the use of the rectifying apron with proper rectifying channels to regulate the bed flow of the stock waters will give an equal interlacing of the fibers, in fact the wire side of the finish sheet will show better arranged fibers than the open side.

To demonstrate the action of the present shake as it is attached to the shake post, and the action of the balance shake on stock water or liquors of any kind, a box should be used from six to ten feet in length by twenty-four inches in width by about six inches in depth having same rest on two pedestals or posts with a shaking device attached to one of the posts. You will note that when you shake the box lengthwise you secure a perfect agitation of the liquors at the top while the bed of the liquors remain relatively at rest. Then connect the two pedestals by means of a girt, locating the medium for shaking centrally between the posts or pedestals, and you will not only have the motion produced by side shaking but a rolling motion reaching to the bed of the water, giving the entire volume of the liquor a uniform agitation without a jerky or breaking motion to the liquors.

Is a Desirable Unit

The balance shake is a desirable unit, that can be easily attached to any existing Fourdrinier part of a paper machine, and also where speed is required, the rectifying apron is an equally desirable feature especially on paper machines, which are operating without shakes, as it is almost impossible to have the fibers float with the current, especially on the wire side of the sheet when a properly designed rectifying apron is used.

The building for the balance shake is being arranged for in this country, and the designers and builders of the unit will be glad to answer any questions with reference to its use and methods of installation.

New Zealanders Study Pulp Mills

To study the lumber and wood pulp industries of North America, the Timberlands Woodpulp, Ltd., New Zealand, sent Prof. H. Hugh Corbin and Ralph P. Worley to Canada and the United States and they have been spending some weeks visiting leading pulp and paper mills in the two countries. Their itinerary carried them across Canada from Vancouver to Montreal, Ottawa, Ontario, New York, Chicago, Madison, and other cities where contacts to their interest could be made. The fundamental purpose of the visitors was to make a comprehensive survey of the timber industries, seeking ways and means for converting the New Zealand timber into products of commercial value. Their general plans include the construction of a pulp mill, and possibly later a paper mill. New Zealand has 1,500,000 people but no pulp or paper mills. In addition to some 12,500,000 acres of native forest the government and private enterprise have planted some half million acres of forest throughout the country. The planting has been going on for a score of years and now, with trees reaching maturity, additional outlets are being sought for forest products.

Crown Willamette Pays Dividend

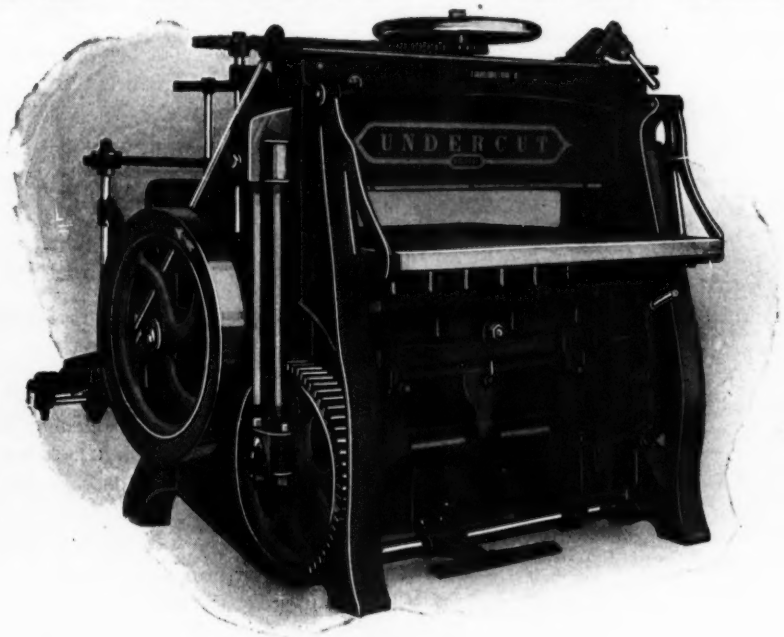
Directors of the Crown Willamette Paper Company on November 24 declared a dividend of $1 a share on first preferred stock, due January 1 on records of December 12. The payment will amount to $200,000.

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
PROVIDENCE, R. I.

THE UNDERCUT PAPER MILL TRIMMER



One of our high efficiency products universally adopted by leading paper mills.

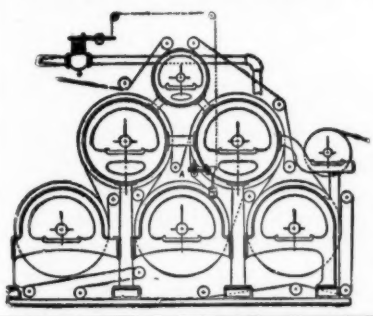
For over a century we have been building

Paper Mill Machinery

Fourdrinier and Cylinder Machines, Jordan Engines, Pumps, Paper Bag Machinery, Paper Mill Trimmers, Etc.

THE SMITH & WINCHESTER MFG. CO., South Windham, Conn.

The Pickles Drying Regulator



WE ARE SAFE IN OUR PROPOSITION

YOU'LL MAKE NO MISTAKE IN ACCEPTING IT

Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES Buckland, Conn.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING DECEMBER 5, 1931

SUMMARY

Cigarette paper	2538 cs.
Wall paper	75 bls., 11 cs.
Paper hangings	10 bls., 2 cs.
News print	6969 rolls
Printing paper	30 cs.
Wrapping paper	4 rolls, 2 pkgs., 13 cs.
Writing paper	6 cs.
Envelopes	22 cs.
Filter paper	10 bls., 38 cs.
Drawing paper	6 cs.
Tissue paper	13 cs.
Baryta coated paper	60 cs.
Metal coated paper	57 cs.
Gold coated paper	8 cs.
Coated paper	51 cs.
Basic paper	36 cs.
Transfer paper	3 cs.
Decalcomania paper	41 cs.
Photo paper	2 cs.
Paste board	33 cs.
Stencil paper	2 cs.
Raw card	35 cs.
Card board	87 bls., 2 cs.
Miscellaneous paper	354 rolls, 115 bls., 90 cs.

CIGARETTE PAPER

Champagne Paper Corp., Liberty, Havre, 295 cs.
American Tobacco Co., Collamer, Bordeaux, 400 cs.
De Manduit Paper Corp., Collamer, St. Nazaire, 1795 cs.
Standard Products Corp., Pennland, Antwerp, 13 cs.
Standard Products Corp., Aquitania, Southampton, 25 cs.
Brown & Williamson Tobacco Co., Aquitania, Southampton, 10 cs.

WALL PAPER

C. Grimmer & Son, Gen. von Steuben, Bremen, 2 bls.
——, Gen. von Steuben, Bremen, 2 bls.
Thomas & Pierson, Amer. Banker, London, 1 cs.
F. J. Emmerich, Baltic, Liverpool, 15 bls.
W. H. S. Lloyd & Co., Aquitania, Southampton, 1 cs.
A. L. Diament & Co., Aquitania, Southampton, 1 cs.
——, Bremen, Bremen, 1 bl.
Irving Trust Co., Deutschland, Hamburg, 8 cs.
F. J. Emmerich, Deutschland, Hamburg, 43 bls.
Globe Shipping Co., Deutschland, Hamburg, 12 bls.

PAPER HANGINGS

W. H. S. Lloyd & Co., Minnetonka, London, 8 bls., 2 cs.
W. H. S. Lloyd & Co., Amer. Banker, London, 2 bls.

NEWS PRINT

Parsons & Whittemore, Inc., Amer. Shipper, Hamburg, 228 rolls.
W. H. Bell, Markland, Liverpool, N. S., 5266 rolls.
Jay Madden Corp., Gen. von Steuben, Bremen, 436 rolls.
Perkins Goodwin & Co., Deutschland, Hamburg, 279 rolls.
Baldwin Paper Co., Deutschland, Hamburg, 110 rolls.
——, Deutschland, Hamburg, 215 rolls.
——, Stavangerfjord, Oslo, 379 rolls.
Stora Kopparberg Corp., Gripsholm, Gothenburg, 56 rolls.

PRINTING PAPER

Japan Paper Co., Gen. von Steuben, Bremen, 2 cs.
Japan Paper Co., Alyaunia, Southampton, 3 cs.
P. C. Zuhlke, Pennland, Antwerp, 2 cs.
——, St. Louis, Hamburg, 17 cs.
J. Henschel & Co., Deutschland, Hamburg, 6 cs.

WRAPPING PAPER

National Freighting Co., Gen. von Steuben, Bremen, 4 rolls.
Ybry, Inc., Pennland, Antwerp, 2 pkgs.
Sylvania Industrial Corp., Pennland, Antwerp, 13 cs.

WRITING PAPER

Globe Shipping Co., Aquitania, Southampton, 2 cs.
De Picciotte, Aquitania, Southampton, 2 cs.
Simfred, Inc., Aquitania, Southampton, 2 cs.

ENVELOPES

Japan Paper Co., Gen. von Steuben, Bremen, 3 cs.
J. Beckhard & Co., Bremen, Bremen, 19 cs.

FILTER PAPER

Coupey fils, Exochorda, Marseilles, 10 bls.
H. Reeve Angel & Co. Inc., Minneonka, London, 4 cs.
H. Reeve Angel & Co. Inc., Aquitania, Southampton, 7 cs.
E. Fougera & Co., Aquitania, Southampton, 27 cs.

DRAWING PAPER

Japan Paper Co., Minnetonka, London, 6 cs.

TISSUE PAPER

M. Snedeker Corp., Minnetonka, London, 1 cs.
B. F. Drakenfeld & Co., Baltic, Liverpool, 3 cs.
Chase National Bank, Bremen, Bremen, 9 cs.

BARYTA COATED PAPER

Globe Shipping Co., Gen. von Steuben, Bremen, 51 cs.
Globe Shipping Co., Bremen, Bremen, 9 cs.

METAL COATED PAPER

K. Pauli Co., Gen. von Steuben, Bremen, 8 cs.
Winter Wolff & Co., Pennland, Antwerp, 3 cs.
——, Pennland, Antwerp, 4 cs.
K. Pauli Co., Deutschland, Hamburg, 42 cs.

GOLD COATED PAPER

F. Murray Hill Co., Gen. von Steuben, Bremen, 8 cs.

COATED PAPER

F. C. Gerlach, Gen. von Steuben, Bremen, 15 cs.
Gevaert Co. of America, Pennland, Antwerp, 34 cs.
Happel & McAvoy, St. Louis, Hamburg, 2 cs.

BASIC PAPER

Globe Shipping Co., Gen. von Steuben, Bremen, 36 cs.

TRANSFER PAPER

Fuchs & Lang Manfg. Co., Amer. Shipper, Hamburg, 2 cs.
Manhattan Decalcomania Co., Bremen, Bremen, 1 cs.

DECALCOMANIA PAPER

C. W. Sellers, Gen. von Steuben, Bremen, 2 cs.
B. F. Drakenfeld & Co., Baltic, Liverpool, 10 cs. (duplex); 6 cs. (simplex).
C. W. Sellers, Bremen, Bremen, 2 cs.
Phoenix Shipping Co., Bremen, Bremen, 3 cs.
C. W. Sellers, Deutschland, Hamburg, 18 cs.

PHOTO PAPER

J. J. Gavin & Co., Aquitania, Southampton, 2 cs.

PASTE BOARD

——, Deutschland, Hamburg, 33 cs.

STENCIL PAPER

G. C. Mitchell, Gen. von Steuben, Bremen, 2 cs.

RAW CARD

F. C. Strype, Gen. von Steuben, Bremen, 35 cs.

CARD BOARD

Gavaert Co. of America, Pennland, Antwerp, 2 cs.
——, Saturnia, Trieste, 87 bls.

MISCELLANEOUS PAPER

Coy Disbrow & Co., Gen. von Steuben, Bremen, 2 cs.
——, Gen. von Steuben, Bremen, 17 cs.
Iwai & Co., Tai Yin, Kobe, 1 cs.
Japan Paper Co., Tai Yin, Kobe, 42 cs.
Keller Dorian Paper Co., Aquitania, Southampton, 5 cs.
Tamm & Co., Pennland, Antwerp, 3 cs.
Bush Service Corp., Alaunia, Southampton, 1 cs.
Atlantic Forwarding Co., Deutschland, Hamburg, 4 cs.
T. Johnson, Gripsholm, Gothenburg, 7 cs.
The Borregaard Co. Inc., Gripsholm, Gothenburg, 115 bls., 354 rolls.
T. N. Fairbanks Co., Conte Biancamano, Genoa, 8 cs.

RAGS, BAGGINGS., ETC.

V. Galaup, Liberty, Havre, 47 bls. rags.
Darmstadt Scott & Courtney, Liberty, Havre, 100 bls. bagging.
E. Mayer, St. Louis, Hamburg, 4 bls. rags.
Castle & Overton, Inc., Eastern Prince, B. Ayres, 41 bls. hessian scrap; 40 bls. burlap scrap.
E. J. Keller Co. Inc., Ambridge, ——, 100 bls. new cuttings.
E. J. Keller Co. Inc., West Arrow, ——, 170 bls. flax waste.

OLD ROPE

Brown Bros. Harriman & Co., Minnetonka, London, 146 coils.

CASEIN

D. C. Andrews & Co., Amer. Shipper, Hamburg, 60 bags.

WOOD PULP

Lagerloef Trading Co., Hallaren, Tolkis, 810 bls. sulphite.
Lagerloef Trading Co., Hallaren, Kemi, 260 bls. wood pulp; 1715 bls. sulphite; 2400 bls. sulphate.
Castle & Overton, Inc., Deutschland, Hamburg, 420 bls. wood pulp, 84 tons.
Chemical Bank & Trust Co., Stavangerfjord, Oslo, 700 bls. sulphite.
Perkins Goodwin & Co., Gripsholm, Gothenburg, 381 bls. sulphite; 127 bls. sulphate.
E. M. Sergeant & Co., Gripsholm, Gothenburg, 598 bls. kraft soda pulp.
Bulkley Dunton & Co., Consul Corfitzen, ——, 1000 bls. wood pulp.

WOOD PULP BOARDS

Lagerloef Trading Co., Deutschland, Hamburg, 233 bls., 36 tons.

WOOD FLOUR

——, Stavangerfjord, Frederickstad, 665 bags.

ALBANY IMPORTS

WEEK ENDING DECEMBER 5, 1931

A. P. W. Paper Co., Ch. Krohg, Sheet Harbor, 2754 tons wood pulp.
Bonaventure Pulp & Paper Co., Kem, Chandler, P. Q., 6819 bls. wood pulp, 1503 tons.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 5, 1931

Katzenstein & Keene, Inc., Collamer, St. Nazaire, 431 bls. rags.
National Vulcanized Fibre Co., Collamer. St. Nazaire, 94 bls. rags.
Castle & Overton, Inc., Collamer, Bordeaux, 38 bls. rags.
Katzenstein & Keene, Inc., Collamer, Bordeaux, 69 bls. rags.
Hoffman Lion Mills, Katsuragi Maru, Kobe, 75 bls. rags.
Philadelphia National Bank, Katsuragi Maru, Kobe, 120 bls. rags.
N. Y. Trust Co., Katsuragi Maru, Kobe, 55 bls. rags.
1st National Bank, Katsuragi Maru, Kobe, 75 bls. rags.

(Continued on page 54)

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

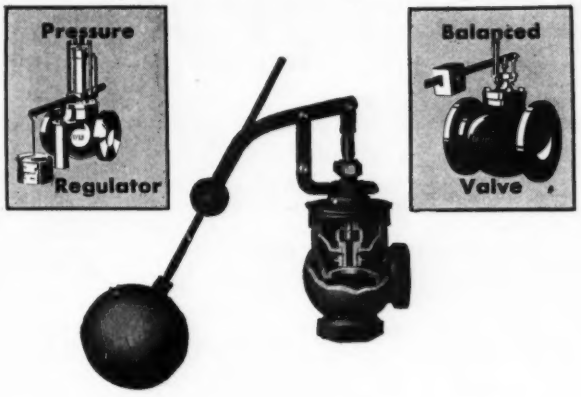
TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856



Faultless Service is yours for the asking

The common faults of many float valves—leaking or sticking—will never trouble you if your valve is a Davis. Its perfected design—simple and effective—insures *faultless service.*

Unlike other Float Valves, the Davis has a single seat with renewable composition disc, and has no leather cup packing. It closes tight and it will not stick. It is a pilot controlled valve operated by pressure.

Your open tank will never overflow if you use a Davis Float Valve on the make-up line. When this valve closes the flow is entirely stopped. It can be used to control pump operation directly by pressure or indirectly through a pump governor.

Have your requisition read DAVIS FLOAT VALVE and enjoy its efficient dependable service.

DAVIS REGULATOR COMPANY
2551 S. Washtenaw Avenue Chicago, Illinois

DAVIS VALVE SPECIALTIES

PTJ 12-10 Gray

Imports of Paper and Paper Stock

(Continued from page 52)

E. J. Keller Co. Inc., Exchester, ——, 102 bls. rags.
——, Exchester, Genoa, 56 bls. rags.
——, Exchester, Alexandria, 26 bls. rags.
E. J. Keller Co. Inc., Remschild, ——, 510 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING DECEMBER 5, 1931

Parsons & Whittemore, Inc., Angsir, ——, 320 bls. sulphite; 840 bls. mechanical pulp.
Parsons & Whittemore, Inc., City of Havre, ——, 250 bls. sulphite.
Bulkley Dunton & Co., Greisheim, ——, 3125 bls. wood pulp.
Bulkley Dunton & Co., City of Havre, ——, 1000 bls. wood pulp.
Gottesman & Co. Inc., Topeka, Sweden, 2400 bls. wood pulp.
Gottesman & Co. Inc., Wytheville, Germany, 550 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING DECEMBER 5, 1931

Logerloef Trading Co., Hallaren, Kemi, 5554 bls. sulphate; 1700 bls. sulphite.
Lagerloef Trading Co., Hallaren, Raumo, 520 bls. sulphite.

PORTLAND IMPORTS

WEEK ENDING DECEMBER 5, 1931

Lagerloef Trading Co., Hallaren, Tolkis, 4142 bls. sulphite.
Lagerloef Trading Co., Hallaren, Kemi, 3390 bls. sulphite; 550 bls. sulphate.
Lagerloef Trading Co., Hallaren, Raumo, 2089 bls. sulphate; 2561 bls. wood pulp.
Gottesman & Co. Inc., Belos, Sweden, 9300 bls. wood pulp.
Bulkley Dunton & Co., Ilona Siemers, ——, 1750 bls. wood pulp.
Parsons & Whittemore, Inc., Ilona Siemers, ——, 300 bls. wood pulp.

Paperboard Industries Elect Officers

The annual meeting of the Paperboard Industries Association was held at the Commodore Hotel, New York City, Thursday afternoon, November 19, 1931. At this meeting and at the Group Meetings held on the 18th and 19th, the following officers were elected for the ensuing year:

President and Chairman of Executive Committee: Henry D. Schmidt, of Schmidt & Ault Paper Company, York, Pa.

Vice-President—Paperboard Group: F. C. Ash, of Oswego Falls Corporation, Fulton, N. Y.

Vice-President—Container Group: M. M. Madson, of C. F. Downey Box Company, No. Kansas City, Mo.

Vice-President—Folding Box Group: H. C. Stevenson, of Rochester Folding Box Company, Rochester, N. Y.

In addition to the president, who was elected by the general membership, and the vice-presidents elected by the individual groups, each of whom was elected a member of the executive committee, the following were also elected as members of the executive committee:

Representing the Paperboard Group: Hugh Strange, John Strange Paper Company, Menasha, Wis.

Representing the Container Group: R. H. Dollison, Fairmont Box Company, Fairmont, W. Va., J. H. Macleod, The Hinde & Dauch Paper Company, Sandusky, Ohio.

Representing the Folding Box Group: John L. Barchard, Hummell & Downing Company, Milwaukee, Wis., E. V. Donaldson, Robert Gair Company, New York, N. Y.

The Annual Meeting of the Three Groups of the Association convened at 2:00 p.m., Thursday, November 19 with president J. M. Macleod presiding.

To Segregate Water Powers

CORINTH, N. Y., December 5, 1931—At a special meeting held here today, the stockholders of the International Paper Company approved the program for the segregation of substantially all the water-power properties in the United States now owned or controlled by the Company, including among others the powers on the Hudson river in the State of New York.

As an initial step, the directly owned properties, with minor exceptions, are to be transferred to subsidiary companies, all the stock of which will be controlled by the International Paper Company. The Company's interest in the properties will not be diminished by these transfers, but its ownership will be changed from a direct to an indirect one.

These transfers will facilitate consummation of the Company's announced policy of ultimately segregating all its power properties under the control of International Hydro-Electric System. It was in accordance with this policy that the International Paper and Power Company was formed in 1928, and that the International Hydro-Electric System was formed in 1929 and acquired from the Paper Company the shares of New England Power Association and of the Canadian Hydro-Electric Corporation, Limited, which the Paper Company then controlled.

Arrangements for the acquisition by the International Hydro-Electric System of control of the water powers to be segregated have not been completed nor have the terms as yet been settled by the respective Boards of Directors. The matter is, however, under consideration and an independent firm of engineers has been retained by the System and is reporting to it upon the transaction.

The inception of the International Paper Company's policy of segregating its water-powers was indicated in the mortgage securing its 6 per cent Refunding Bonds issued in 1925. This mortgage expressly provides for the release of the directly owned water-powers of the Paper Company to a directly or indirectly owned subsidiary (the stock of the directly owned subsidiary to be pledged under the mortgage), and specifies the conditions under which the assets of the direct or indirect subsidiary may be sold. The plan approved by the stockholders contemplates a release of these properties from the refunding mortgage, most of them under the foregoing provision. The lien of the first and refunding mortgage, securing the 5 per cent Gold Bonds of the Paper Company, will remain unchanged on the Hudson River powers and on all of the other powers, except three properties in New Hampshire and Vermont for which other water-powers not heretofore subject to the lien of either mortgage will be substituted. The plan contemplates, moreover, that the Company acquiring the properties, except the three last mentioned, will assume payment of the principal, interest and sinking fund of these 5 per cent bonds.

TAPPI Lake States Section Meets

The Lake States Section of the Technical Association of the Pulp and Paper Industry met Tuesday evening, December 8 at Menasha, Wis.

Two papers were read, the first day by C. J. Christiansen of Fibre Making Processes, Chicago, on "Indirect Heating and Outside Circulation in Alkaline and Sulphite Pulping," and the second by G. L. Cavaness of the Crane Company, 37 Market street, Oshkosh, Wis., on the subject of "Little Leaks—Big Waste."

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

YOUR COPY

of this valuable booklet

IS READY

Its title? "Evidence on Paper". Here are reviewed the practices in a number of mills using our silicate of soda in the manufacture of paper.

A request for the booklet entails no obligation. A representative will call only at your invitation.

PHILADELPHIA QUARTZ CO.

General Offices and Laboratory
121 S. Third St., Philadelphia
Chicago Office: 205 W. Wacker Drive

Glens Falls Machine Works

GLENS FALLS, N. Y.

Manufacturers of

IMPROVED ROGERS AND SPECIAL WET MACHINES

STANDARD WET MACHINES

GLENS FALLS ROLLING ACTION FLAT SCREEN

THE A. D. WOOD SAVEALL, THICKENER, WASHER AND WATER SCREEN

GLENS FALLS DECKER AND DECKER WASHER

GLENS FALLS ROTARY SULPHUR BURNER

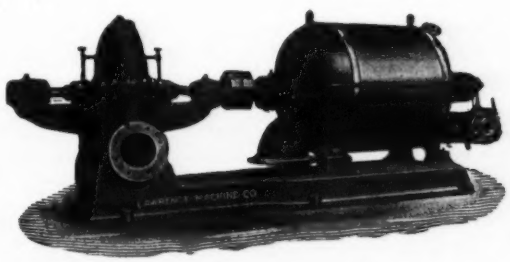
PULP GRINDERS, THREE OR FOUR POCKET (Roller Bearings)

Ask us about the
OLIVER-ROGERS WET MACHINE

Horizontally Split Casing Double Suction Pumps

LAWRENCE PUMPS

The name protects and guarantees you satisfaction.
We are the original designers and builders of the LAWRENCE PUMP.



Lawrence pumps for all conditions and services. Forty-four years of practical experience with centrifugal pump development places us among the leaders. Our efforts have been rewarded by the acceptance of our product in general.

Thousands of installations and the successful performance of our pumps should be sufficient proof of our ability to handle your pumping problems. Our engineering force is at your command.

Have only Lawrence Pumps, manufactured by the

Lawrence Machine & Pump Company
361 Market St. Lawrence, Mass.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, December 9, 1931.

Trading in the local paper market was moderately active during the past week. Demand for the various standard grades of paper was mostly along seasonal lines. Inquiries for future delivery are fairly numerous. The price situation continues unsatisfactory, due mainly to intense competition for desirable orders.

While efforts to stabilize the price of news print paper are being made by the leading manufacturers, the outlook for the future is very uncertain. Following the announcement last week by the International Paper Company that it stood ready to reduce the price of paper as soon as the situation clarified, the Great Northern Paper Company announces that its price for 1932 would be $55 per ton, at mill, a reduction of $2 per ton. On Monday of this week the International announced a reduction of $4 per ton and the same reduction was announced by two Canadian concerns.

The paper board market is showing some signs of improvement. Production of box board is being maintained in sufficient volume to take care of current requirements. Prices remain unchanged. Demand for the various grades of fine paper is fairly persistent. Prices are easy. Tissues are going forward in fair volume. The coarse paper market is irregular.

Mechanical Pulp

Reports of the imminent dissolution of the Scandinavian Mechanical Pulp Cartel, which includes Swedish, Norwegian and Finnish mills, are having some effect on the local ground wood market and increasing competition is anticipated, in some quarters. The present term expires March 1, 1932, but some North Swedish mills have already withdrawn.

Chemical Pulp

Demand for the various grades of domestic and imported chemical pulp is lighter than usual at this time of the year, although it is reported that some good orders for 1932 delivery are being booked. Foreign unbleached pulp is easier. No. 1 strong unbleached is now quoted at from $1.60 to $2.15; while Mitcherlich unbleached is offered at from $1.70 to $2.10, on dock, Atlantic ports.

Old Rope and Bagging

Trading in the old rope market continues quiet. Little interest is being displayed by the paper mills at present in either domestic or imported old manila rope. Small mixed rope is dull. The bagging market is fairly active. Gunny and scrap are steady, while roonng bagging is in seasonal request. Prices are generally unchanged.

Rags

The position of the domestic rag market is practically unchanged. Demand for the various grades of cotton rags is light. Roofing grades are less active than usual at this season. Mixed rags are listless. Prices are rather soft. Due to fluctuations in the value of foreign exchange, the imported rag market is unsettled.

Waste Paper

Board mill interest in the lower grades of waste paper is lacking and prices are somewhat spotty. Demand for the better grades of waste paper is fairly satisfactory. Book stock is exhibiting a strong undertone, while hard white shavings continue steady to firm. No. 1 white news is also displaying some strength.

Twine

No radical changes were reported in the local twine market. The volume of sales is being well maintained and is well up to the record of a year ago. There are a number of inquiries around for future needs, some of which should materialize into good orders. Prices are holding to previously quoted levels.

Better Demand in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., December 7, 1931.—There can be no doubt of more activity in the paper trade here just now. Much of this increase is due to the nearness of the holiday season. Jobbers say there is improvement in many lines of the trade. It is true some lines have not benefitted much, but on the whole conditions are better.

With the coming of the first of the year it is certain the consumers of paper and paper products will go into the inventory period with even lower stocks than they had a year ago. This will not be due so much to a feeling that there will be lower prices, hence careful buying, but as a matter of policy of not having too much tied up in stock.

When present holiday demands have been supplied there is little business expected until after the first of the year, when some contracts will be signed.

Only an indifferent demand is coming now from the book publishers. And prices are none too steady.

Paper manufacturers in the state are working three or four days a week for the most part. The carton and box factories, now that the bulk of the Christmas trade has been supplied, have slumped back to the former level of production. They are looking forward to better business next year, however. A good demand continues to be reported by the manufacturers of waxed bread wrappers.

New Elwell-Parker Electric Co. Booklet

"Paper Must Be Moved Easily—Cheaply" is the title of a new catalog published by the Elwell-Parker Electric Company, of Cleveland, Ohio. Illustrated with over 45 photographs of actual handling operations in the paper and publishing industries, this booklet explains many of the modern methods of paper handling and contains many valuable suggestions to the organizations that uses large quantities of paper, whether paper manufacturer, publisher or paper merchant.

MURRAY WOOD CLEANER
Motor driven model shown. Also available in belted types. *Above*: the Murray barker with straight and concave head. *Right*: Knot saw which replaces either head to make Duplex Combination.

Remove Those "Pepper" Specks from Your Sheet

THE *Murray Duplex Combination Wood Cleaner* not only barks slabs, edgings and sawmill refuse but is equally effective on round pulpwood. The knot saw takes out "by the roots" the black knot that creates specks in a sheet.

WRITE for details of Murray complete Wood Room equipment

D. J. MURRAY MANUFACTURING COMPANY
WAUSAU WISCONSIN

TI MACHINE SEMI-STEEL SECTIONAL BURRS

Manufactured in 3, 4, 5, 6 and 7 cuts per inch.

SHARP — STRONG — TOUGH

3" Diam.

ILLUSTRATION SHOWS ½ SIZE

OTHER SPECIALTIES

WARREN IMPROVED CALENDER With flexible blades, Universal Adjustment and Control, Patented — DOCTORS

WARREN IMPROVED DOUBLE DRUM— WINDER

BALL HYDRANT for Stock Circulating Systems — VALVES

AND OTHER PAPER MILL MACHINERY

MANUFACTURED BY

TICONDEROGA MACHINE WORKS
TICONDEROGA, N. Y.

SEND FOR BULLETINS—ASK FOR PRICES.

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED and MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, Index Bristol, Post Card and Label Papers

High Grade Coated Book

also

KRAFT WRAPPING AND KRAFT ENVELOPE

Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

230 Park Ave. New York — 35 East Wacker Drive Chicago

503 Market St., San Francisco, Cal.

Sixth and Chestnut Sts., Philadelphia, Pa.

---

100 Tons Kraft Per Day — 58% A. D.
With the Famous Kamyr Wet Machine

Production . . . .

Kraft	up to 100 Tons
Sulphite	up to 80 Tons
Soda	up to 60 Tons
Groundwood	up to 50 Tons

Results . . . . . .

With 1 Press	42% A.D.
With 2 Presses	55% A.D.
With 2 Presses & Predryer	58% A.D.

Saves . . . . . .

Felt, Wires, Labor, Upkeep, Power, Fibre, Floor Space

G. D. JENSSEN CO.

Chrysler Bldg., N. Y. C. — *Sole Agents in U. S. A. for* PAPER MACHINERY Ltd. MONTREAL — 1017 White Bldg., SEATTLE

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, December 9, 1931.

BLANC FIXE.—Conditions in the blanc fixe market are fairly satisfactory. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—The position of the bleaching powder market is practically unchanged. Contract shipments are moving in seasonal volume. Prices remain unaltered. Bleaching powder is quoted at from $1.75 to $2 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues listless. Domestic standard ground is quoted at 7½ cents and finely ground at 8 cents per pound. Argentine standard ground is selling at 8½ cents and finely ground at 9½ cents pound, all in bags, car lot quantities.

CAUSTIC SODA.—Trading in the caustic soda market is brisk and contracts for 1932 are being booked in good volume. Solid caustic soda is quoted at from $2.50 to $2.55 and the flake and the ground at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is moderately active. Shipments against contract are going forward with fair irregularity. Imported china clay is quoted at from $11 to $15 per ton. Domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—Demand for chlorine is fairly persistent. Supplies are moving into consumption in good volume. Prices are generally holding to schedule. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is quiet and prices are easy. The grades of gum rosin used in the paper mills are now quoted at from $3.90 to $4.05 per 280 pounds, in barrels, at works. Wood rosin is selling at $3.90 per 280 pounds, in barrels, on dock.

SALT CAKE.—Steadiness prevails in the salt cake market. Prices are unchanged. Salt cake is quoted at from $15 to $16; chrome salt cake at from $13 to $14 per ton, in bulk, at works. Imported salt cake is selling at from $15 to $15.50 per ton, ship side.

SODA ASH.—The soda ash market is exhibiting a strong undertone and a good volume of contract business is being booked for 1932. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1; in bags, $1.25; and in barrels, $1.38.

STARCH.—Demand for starch from the paper mills is light at present and most of the business transacted is routine. Prices are easier. Special paper making starch is now quoted at $2.77, in bags; and at $3.04, in barrels, per 100 pounds, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is displaying a steady trend. Prices are holding to schedule. Commercial grades are quoted at from $1.25 to $1.49; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at mine; imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@38.00
Bonds	5.00	@53.25
Index	6.00	@12.00
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine sized	6.75	@11.00
Book, Cased—		
S. & S. C.	5.25	@ —
M. F.	5.00	@ —
Coated and Enamel	6.25	@ 9.75
Lithograph	6.75	@11.25
Tissues—Per Ream—		
White No. 1	.65	@ .70
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
White No. 2	.55	@ .60
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middies	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¾	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¼	@ —

(Delivered New York)

News, per ton—		
Rolls, contract	57.00	@ —
Rolls, spot	57.00	@ —
Sheets	62.00	@ —
Side Runs	42.00	@46.00
Kraft—		
No. 1 Domestic	4.50	@ 5.75
No. 2 Domestic	3.00	@ 4.25
Southern	2.75	@ 4.00
Imported	6.00	@ 7.00
Boards—per ton—		
News	26.00	@27.50
Straw	34.50	@45.00
Chip	25.00	@27.50
Binders' Boards	62.00	@70.00
Standard 85 Test Liner	32.50	@35.00
Sgl. Mla. Ll. Chip	37.50	@42.50

(F. o. b. Mill)

Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	24.00	26.00
Dry	25.00	@26.50

(F. o. b. Mill)

No. 1 Domestic	25.00	@30.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	2.40	@ 3.50
Easy Bleaching	2.00	@ 2.10
No. 1 strong unbleached	1.60	@ 2.15
Mitscherlich unbleached	1.70	@ 2.10
No. 2 strong unbleached	1.70	@ 1.80
No. 1 Kraft	1.50	@ 1.75
No. 2 Kraft	1.40	@ 1.50
Sulphate—		
Bleached	2.75	@ 3.25

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	2.25	@ 4.50
Easy Bleaching	2.15	@ 2.35
News	1.80	@ 2.50
Mitscherlich	2.40	@ 2.55
Kraft (Domestic)	1.60	@ 2.75

(Delivered Paper Mills)

Soda Bleached	2.75	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	6.50	@ 7.00
New White, No. 2	5.50	@ 6.00
Silesias No. 1	5.25	@ 5.50
New Unbleached	7.00	@ 7.50
New Blue Prints	4.00	@ 4.50
New Soft Blacks	3.50	@ 4.00
Blue Overall	5.00	@ 5.25
Fancy	3.00	@ 3.50
Washables	2.75	@ 3.00
Mixed Khaki Cuttings	3.50	@ 4.00
Pink Corset Cuttings	5.00	@ 5.50
O. D. Khaki Cuttings	4.50	@ 4.75
Men's Corduroy	3.00	@ 3.50
New Mixed Blacks	3.00	@ 3.25

Old Rags

White, No. 1—		
Repacked	5.25	@ 5.75
Miscellaneous	4.25	@ 4.75
White, No. 2—		
Repacked	3.00	@ 3.50
Miscellaneous	2.30	@ 2.50
St. Soiled, White	1.50	@ 1.75
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.65	@ 1.85
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.25	@ 1.30
No. 1	1.25	@ 1.30
No. 2	.90	@ 1.00
No. 3	.70	@ .80
No. 4	.65	@ .70
No. 5A	.50	@ .60

Foreign Rags

New Rags

New Dark Cuttings	1.75	@ 1.85
New Mixed Cuttings	2.00	@ 2.20
New Light Silesias	4.50	@ 4.75
Light Flannelettes	4.25	@ 4.50
Unbleached Cuttings	6.00	@ 6.25
New White Cuttings	5.25	@ 5.50
New Light Oxfords	4.00	@ 4.25
New Light Prints	3.00	@ 3.25

Old Rags

No. 1 White Linens	6.00	@ 6.25
No. 2 White Linens	5.00	@ 5.25
No. 3 White Linens	3.50	@ 4.00
No. 4 White Linens	2.00	@ 2.50
No. 1 White Cotton	4.25	@ 4.75
No. 2 White Cotton	3.25	@ 3.50
No. 3 White Cotton	2.50	@ 3.00
No. 4 White Cotton	1.45	@ 1.60
Extra Light Prints	1.90	@ 2.10
Ord. Light Prints	1.60	@ 1.75
Med. Light Prints	1.40	@ 1.55
Dutch Blue Cottons	1.50	@ 1.60
French Blue Linens	2.25	@ 2.40
German Blue Linens	2.00	@ 2.10
German Blue Cottons	1.35	@ 1.40
Checks and Blues	1.25	@ 1.30
Lindsay Garments	.90	@ 1.00
Dark Cottons	.70	@ .75
Old Shopperies	.65	@ .70
New Shopperies	.60	@ .65
French Blues	1.40	@ 1.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.50	@ 1.55
Domestic	1.60	@ 1.65
Wool Tares, light	1.05	@ 1.10
Wool Tares, heavy	1.10	@ 1.15
Bright Bagging	1.05	@ 1.10
Small Mixed Rope	.90	@ 1.00
Manila Rope—		
Foreign	1.65	@ 1.75
Domestic	1.75	@ 1.90
New Burlap Cut	1.70	@ 1.80
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	2.55	@ 2.75
Hard, white, No. 2	2.10	@ 2.20
White envelope cuttings	2.15	@ 2.25
Soft, white, No. 1	1.85	@ 1.95
Flat Stock—		
Stitchless	.70	@ .80
Overissue Mag.	.70	@ .80
Solid Flat Book	.60	@ .70
Crumpled No. 1	.45	@ .50
Solid Book Ledger	1.75	@ 1.85
Ledger Stock	.60	@ .70
New B. B. Chips	.20	@ .30
Manilas—		
New Env. Cut.	1.75	@ 1.85
New Cuttings	1.40	@ 1.50
Extra No. 1 old	1.05	@ 1.15
Print	.45	@ .50
Bogus Wrapper	.45	@ .50
Container	.25	@ .30
Old Kraft Machine—		
Compressed bales	1.05	@ 1.15
News—		
No. 1 White News	1.60	@ 1.65
Strictly Overissue	.35	@ .45
Strictly Folded	.30	@ .35
No. 1 Mixed Paper	.18	@ .23
Common Paper		Nominal

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation	Paper and Pulp Mills
Reports	Hydro-Electric and
Valuations	Steam Power Plants
Estimates	Plans and Specifications

Hardy S. Ferguson & Co.

Consulting Engineers

200 Fifth Avenue, New York City

Hardy S. Ferguson.....Member A.S.C.E., A.S.M.E., E.I.C.
Moses H. Teaze.....Member A.S.M.E., E.I.C.
J. Wallace Tower.....Member A.S.C.E., A.S.M.E.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants
Dams and other Hydraulic Structures.

20 plants to serve You

PAPER MAKERS CHEMICAL CORP.
Kalamazoo, Michigan

PERMANENT COLORS

Browns Greens Reds Yellows

BROWNS
Oxides of Iron
Turkey Umbers

GREENS
Chromic Oxides
Guignet's Green

REDS
All types and shades of Oxides of Iron

YELLOWS
Ochres
Iron Hydroxides

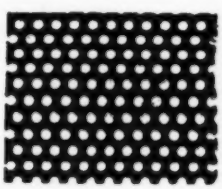
Asbestines and Talcs for Fillers

C. K. WILLIAMS & CO.
EASTON, PA.

Perforated Metal Screens

For Pulp and Paper Mills

STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.



".065" Round

CHARLES MUNDT & SONS
63-65 FAIRMONT AVE. JERSEY CITY, N. J.

DUCTILE — TOUGH

KELLOGG *Masterweld*

DIGESTERS

Boiler Drums • Headers • Receivers
Separators and Complete
Power Plant Piping

THE M. W. KELLOGG COMPANY
225 Broadway, New York City, and at Birmingham
Boston, Chicago, Los Angeles, Tulsa

All Kellogg Welded Products Are Insurable

GIANT

RAGS — BURLAP
BAGGING — ROPE

JUTE BUTTS, MAGAZINES, CATALOGS OLD PAPERS, THREAD WASTE AND ALL GRADES OF RAGS CUT QUICKLY AND EFFICIENTLY WITH THE

TAYLOR, STILES & COMPANY GIANT REG. U.S. PAT. OFF. RIEGELSVILLE, N.J. U.S.A.

This is the GIANT 2A CUTTER WITH A CAPACITY OF 3000 lbs. PER HOUR
GIANT RAG CUTTERS HAVE CAPACITIES OF FROM 1 to 5 tons per hour.

THE STANDARD OF THE WORLD FOR 60 YEARS
TAYLOR, STILES & COMPANY
RIEGELSVILLE, N. J.
CANADIAN REPRESENTATIVES
Waterous Engine Works Company, Ltd., Brantford, Ont., Canada
SOLE AGENTS FOR EUROPE
R. J. Marx. 133-139 Finsbury Pavement, London, E. C.

Mill Cogs

ON SHORTEST POSSIBLE NOTICE

We make all kinds of Mill Cogs and have special facilities that will be of great service to you. We make a specialty of "ready dressed" cogs which are

READY TO RUN

the moment driven and keyed. Write at once for circular "G" and instruction sheets free.

THE N. P. BOWSHER CO.
South Bend, Ind.
Established 1882

Twines

(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.13	@	—
No. 2	.11	@	—
Tube Rope—			
4-ply and larger	.09	@	—
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine			
Balls	.07	@	—
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.21	@	.22

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manilt	.04	@	.04½
No. 1 Kraft	4.50	@	5.00
Southern Kraft	3.00	@	3.25
No. 2 Kraft	3.00	@	3.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½

(Delivered Central Territory)

News, per ton—			
Rolls, contract	57.00	@	—
Sheets	62.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	1.95	@	2.05
No. 1 Soft White	1.80	@	1.90
Ledger & Writings	.60	@	.70
Solid Books	.60	@	.70
Blanks	1.40	@	1.55
Krafts	1.15	@	1.25
New Kraft Cuts	1.30	@	1.45
Manila Env. Cuts	1.40	@	1.50
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.50
Old Newspapers—			
No. 1	.35	@	.45
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.25	@	.30
No. 2	.25	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.07	@	.40
Writings—			
Superfine	.12	@	.18
Extra fine	.16	@	.22
Fine	.15	@	.26
Fine, No. 2	.12	@	.25
Fine, No. 3	.07	@	.20
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.07	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.03¾	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.04
Southern Kraft No. 2	—	@	.03¾
Common Bogus	.03	@	.04

(Delivered Philadelphia)

News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	30.00	@	32.00
Chip Board	25.00	@	27.50
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	63.00	@	65.00
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06	@	.06½
New White, No. 2	.05	@	.05½
Light Silesias	.05	@	.05½
Silesias, No. 1	.06	@	.08
Black Silesias, soft	.05	@	—
New Unbleached	.06	@	.06½
Washable, No. 1	.02½		.03
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02	@	.02½
New Blue	.02	@	.02½
Fancy	.03	@	.03¼
New Black Soft	.03	@	.03½
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O.D.	.04½	@	.05
No. 2 Mixed	.03½		.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.25	@	2.75
M. G.	4.50	@	—
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.75	@	2.00
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.50
No. Hard White	2.00	@	2.25
No. 1 Soft White	1.75	@	2.00
No. 2 Soft White	1.40	@	1.50
No. 1 Mixed	.75	@	.80
No. 2 Mixed	.50	@	.55
Solid Ledger Stock	1.35	@	1.40
Writing Paper	.80	@	1.00
No. 1 Books, heavy	.70	@	.75
No. 2 Books, light	Normal		
No. 1 New Manila	1.60	@	1.75
No. 1 Old Manila	1.25	@	1.30
Print Manila	.50	@	.55
Container Manila	.40	@	.45
Old Kraft	1.10	@	1.20
Common Paper	.30	@	.40
No. 1 Mixed Paper	.35	@	.45
Straw Board, Chip	.35	@	.45
Binders Board, Chip	.35	@	.45
Corrugated Board	.45	@	.50
Overissue News	.50	@	.55
Old Newspaper	.30	@	.35

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag Content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	—	@	.03

(F. o. b. Boston)

Southern Kraft	—	@	.03

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)

Common Bogus	.02	@	.02¾

(Delivered New England points)

News Print, rolls	—	@	56.50
Straw Board, rolls	.009	—	@52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	27.50	@	30.00
Chip Board	27.50	@	—
Chip Board (Creasing)	27.50	@	30.00
Single Manila Lined Chip	40.00	@	45.00
Single White, Patent Coated News Board—			
Binder	52.50	@	60.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	67.50	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.50
No. 2 Hard White	2.25	@	2.50
No. 1 Soft White	1.75	@	2.00
No. 2 Mixed	.50	@	.55
No. 1 Mixed	.75	@	.85
Solid Ledger Books	1.75	@	2.00
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.65	@	.75
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.50	@	1.60
Kraft No. 1	.95	@	1.05
Manila	.90	@	1.00
No. 1 Mixed Paper	.25	@	.35
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers	.32½	@	.40
Box Board, Chip	.20	@	.25
Corrugated Boxes	.37½	@	.47½

Bagging

(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	1.25
Domestic	1.40	@	1.50
Manila Rope—			
Foreign	1.50	@	1.75
Domestic	1.75	@	2.00
Transmission Rope	1.25	@	1.40
Mixed String	.35	@	.40
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.75	@	.90
Bleachery Burlap	2.50	@	2.75
No. 1 Scrap Burlap	1.10	@	1.25
Scrap Sisal	1.35	@	1.45
Scrap Sisal for shredding	1.50	@	1.60
Wool Tares, heavy	1.25	@	1.30
New Burlap Cutting	1.50	@	1.75
Australian Pouches	2.00	@	2.25
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	.90	@	1.05
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1.	.06½	@	.07
New White No. 2.	—	@	.06
Silesias No. 1	.06	@	.06¼
New Black Silesias	.02½	@	.02¾
New Unbleached	—	@	.08
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades—			
Blue Overalls	.05	@	.06
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04½
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	—	@	4.00
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.50	@	2.75
Thirds and Blues—			
Repacked	1.60	@	1.80
Miscellaneous	1.00	@	1.20
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	—	@	.63
No. 2	—	@	.58
No. 3	—	@	.53

Foreign Rags

Dark Cottons	—	@	.70

(F. o. b. Boston)

New No. 1 White Shirt Cuttings	6.50	@	6.75
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.55	@	1.65
Old Linsey Garments	.80	@	.90

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.11¼	@	—
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (Carloads)	6.65	@	—
No. 3 M. F. (Carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.60	@	—
White Wrap	5.10	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.60	@	—
Fiber	5.60	@	—
Kraft, M. F.	5.98	@	—
Kraft No. 2	5.60	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	56.50	@	57.00
Sheets	61.50	@	—

Pulp

(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	44.00	@	—
Sulphite, bleached	62.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.60	@	—
Soft White	2.40	@	—
White Blk. News	1.40	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	1.05	@	—
Ledgers and Writings	—	@	—
Manilas—			
New Manila Cut	1.40	@	—
Printed Manilas	.50	@	—
Kraft	1.65	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.45	@	—
No. 1 Mixed Paper	.35	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¾

Pumps in the Paper Trade

handling chemicals and acids must have an abundance of lubricant that resists the cutting action of the fluids with which it comes in contact.

These packings give long, satisfactory service as their lubricant is especially compounded to meet the exacting demands of each particular service.

It is the Length of Service that Determines the Real Value of a Packing.

Some packings have so little lasting qualities as to be very expensive, even in spite of their low first cost.

The real expense is in the frequent renewals where the cost of the labor is far more than the value of the packing.

Let us send you free working samples to prove what we claim. *State size and service.*

GREENE, TWEED & CO.
Sole Manufacturers
109 Duane St., New York

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTIETH YEAR

Published Every Thursday by the
LOCKWOOD TRADE JOURNAL CO., Inc.

GEO. S. MACDONALD, President: J. BANNINGA, Sec.-Treas.

Published at 34 No. Crystal St., East Stroudsburg, Pa.
Executive and Editorial Offices: 10 East 39th Street, New York
Chicago Office: 123 West Madison St.

TABLE OF CONTENTS

Copyright, 1931, by the Lockwood Trade Journal Co., Inc.

Paper Production for Month of October 15
Japanese Cut Paper Output 15
Rush Work on Forest Products Laboratory.. 16
Completing Construction at Thilmany 16
Atlas Tag Co. Formed 16
Forestry Congress Meets 17
Demand Slow in Indianapolis 17
Dryden Paper Co. Report 17
Philadelphia Demand Shows Improvement 18
Goldman Paper & Stock Buys Large Tonnage 18
Conditions Slow in Chicago Territory 20
Paperboard Industries Meet 20
Boston Demand Holds Up Fairly Well 22
Carter, Rice & Co. Activities 22
Get Patents on Regulators 22
Ontario to Stabilize News Print Industry 24
Campbell Wins News Print Suit 24
Improvements at Don Valley 24
Specially Made Paper for Government 24
New York Trade Jottings 26
Editorial 28
Regal Paper Co. Sold 29
Venezuela Taxes News Print 29
TAPPI Notes 29
To Make Wood Plugs at Newcastle 29
Technical Section
Analysis of Sulphuric Acid 31
New TAPPI Members 31
Analysis of Sulphur-Burner Gas 32
Sulphite Pulping Process Developments 33
TAPPI Education Committee Activities 34
Rapid Laboratory Sheet Making and Testing 35
Current Paper Trade Literature 39
Cost Section 43
Obituary 46
Copper Pipe and Fittings 47
Imports of Paper and Paper Stock 50
New York Market Review 54
Miscellaneous Markets 56
Market Quotations 56

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 59, 60, 61

Air Washed Clay—Ground Clay—Crude Clay
Capacity 100,000 tons per year.

R. T. VANDERBILT CO.

230 Park Ave.
New York

RAYOX — (PURE TITANIUM DIOXIDE)

You will find that a small percentage of Rayox added to your clay will give that increased opacity that you have been looking for.

The white pigment of highest known opacity value. Technically it is the whitest and brightest of all white pigments.

It has the highest hiding power and tinting strength and the greatest resistance to chemical change of any known white opaque pigment.

Rayox may also be successfully used to increase the finish and opacity of your coating solution.